

ENVIRONMENTAL RESOLUTIONS, INC.

CORRECTIVE ACTION PLAN

For

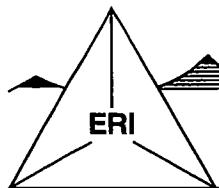
**Redwood Oil Company Facility 114
1855 Guerneville Road
Santa Rosa, California**

ERI Job 261905.R02

April 17, 2006

Prepared for

**Redwood Oil Company
50 Professional Center Drive, Suite 100
Rohnert Park, California 94928**



ENVIRONMENTAL RESOLUTIONS, INC.

April 17, 2006
ERI 261905.R02

Mr. John Mahoney
Redwood Oil Company
50 Professional Center Drive, Suite 100
Rohnert Park, California

SUBJECT Executive Summary of Corrective Action Plan
Redwood Oil Facility 114
1855 Guerneville Road
Santa Rosa, California

Mr. Mahoney,

At the request of Redwood Oil Company (Redwood), Environmental Resolutions, Inc. (ERI) is submitting the attached Corrective Action Plan (CAP) for the subject site. The CAP provides a summary of environmental assessment and remediation activities at the site, evaluates technical alternatives for the remediation of soil and groundwater within vadose soil and the upper saturated zone (Zone A) beneath the site, and proposes a specific remedial technology. This CAP was prepared in response to a letter from the California Regional Water Quality Control Board, North Coast Region (the Regional Board), dated January 10, 2006.

ERI evaluated three remedial options: 1) soil excavation; 2) groundwater extraction and treatment; and 3) two-phase extraction. Based on the distribution of residual and dissolved-phase hydrocarbons and associated constituents in the subsurface, the results of previous remediation efforts, and a comparison of remedial technologies, the CAP recommends that two-phase extraction be implemented to remediate the groundwater beneath the site.

DOCUMENT DISTRIBUTION

ERI recommends that a signed copy of the CAP be forwarded to:

Ms. Joan Fleck
California Regional Water Quality Control Board
North Coast Region
5550 Skylane Boulevard, Suite A
Santa Rosa, California 95403

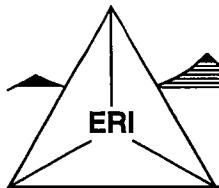
Sincerely,
Environmental Resolutions, Inc.

Glenn Matteucci
Project Manager

Enclosure: Corrective Action Plan

REFERENCE

California Regional Water Quality Control Board, North Coast Region. January 10, 2006. Comments on Supplemental Evaluation of Groundwater and Domestic Well Head Treatment System Installation, Redwood Oil #114, 1855 Guerneville Road, Santa Rosa, Case No. 1TSR088.



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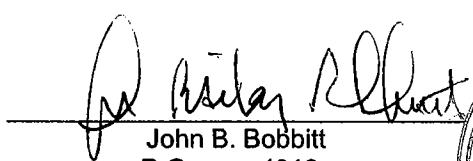
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by

Environmental Resolutions, Inc.



Glenn L. Matteucci
Project Manager



John B. Bobbitt
P.G. 4313

April 17, 2006

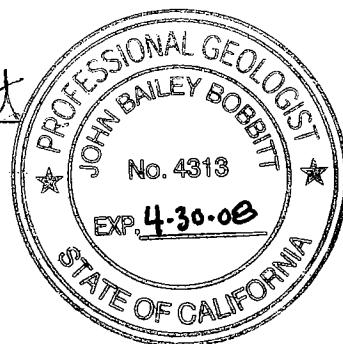


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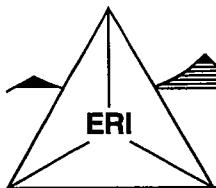
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AND TREATMENT SYSTEM



ENVIRONMENTAL RESOLUTIONS, INC.

CORRECTIVE ACTION PLAN

for

Redwood Oil Facility 114
1855 Guerneville Road
Santa Rosa, California

For Redwood Oil Company

1.0 INTRODUCTION

At the request of Redwood Oil Company (Redwood), Environmental Resolutions, Inc. (ERI) prepared this Corrective Action Plan (CAP) for Redwood Service Station 114, in Santa Rosa, California. The CAP presents a summary of environmental site activities conducted to date, and an approach for soil and groundwater remediation within vadose soil and the upper saturated zone beneath the site. This CAP was prepared in response to a directive from the California Regional Water Quality Control Board, North Coast Region (the Regional Board), dated January 10, 2006 (Appendix A).

2.0 BACKGROUND

2.1 Site Description

The site is located on the northeastern corner of Guerneville Road and Marlow Road in Santa Rosa, California, as shown on the Site Vicinity Map (Plate 1), and is currently an operating Redwood Oil service station facility with one 15,000-gallon and one 12,000-gallon double-walled fiberglass underground storage tanks (USTs), four dispenser islands, and convenience store. The locations of existing USTs, dispenser islands, and other select features are shown on the Generalized Site Plan (Plate 2). The site is located within a mixed residential and commercial area of Santa Rosa and many of these properties utilize private wells for water supply. Three additional leaking underground fuel tank (LUFT) cases are reported within 1,000 feet of the site. These include an operating Shell-branded service station and car wash directly west of the site; a 76-branded service station located at the southeast corner of the Guerneville Road and Marlow Road intersection; and a dry cleaning facility south of the site.

2.2 Site History

A summary of site activities, including remedial efforts at the site is documented in the reports listed in the Reference section of this CAP and is as follows:

- 1978: Redwood purchased the facility.
- January 1979: Redwood acquired and began operating an existing ARCO service station at the site. Facilities included a 7,500-gallon fiberglass diesel UST; and 6,000 and 8,000-gallon fiberglass gasoline USTs.
- In 1981: Redwood rebuilt the service station including installation of one additional 12,000-gallon wrapped steel UST (supplementing the existing two fiberglass USTs and one fiberglass lined UST); new product lines; and new aboveground facilities.

- 1989: Redwood removed and replaced the product lines with double-wall fiberglass piping; and installed piping and a tank level sensing system following a report of nearby hydrocarbon contamination observed at the southern portion of the Marlow Road/Guerneville Road intersection during work associated with underground utility upgrades.
- May 1989: Redwood filed an Unauthorized Leak Report when a faulty product line was detected.
- September 1989: Earthtec Ltd. (Earthtec) drilled five soil borings (SB1 through SB5) and installed groundwater monitoring wells MW1 through MW3.
- October 1989: Quarterly monitoring was initiated at the site.
- 1989: Separate-phase hydrocarbons (SPH) were detected in well MW2.
- January 1991: Water was detected in the 8,000-gallon fiberglass gasoline UST.
- 1991: A sensitive receptor survey (SRS) was completed. Eighty-five water wells were identified within 2,000 feet of the site.
- September 1991: Three domestic wells located at 2050 (1 well) and 2053 (2 wells) Marlow Road were sampled. Dissolved-phase hydrocarbons, including total petroleum hydrocarbons as gasoline (TPHg); total petroleum hydrocarbons as diesel (TPHd); benzene, toluene; ethylbenzene; and total xylenes (BTEX); total oil and grease (O&G); volatile organic compounds (VOCs); and/or 5 CAM metals, were not detected above laboratory reporting limits in the wells except for zinc detected in the sample collected from the 2050 Marlow Road well at a concentration of 57 parts per billion (ppb).
- November 1991: Redwood installed a passive product-recovery skimmer (PRS) in well MW2 and operated the system until March 1992 (no product was recovered). The PRS was restarted in June 1992 and operated until removed during the 1993 UST replacement operations. SPH was last detected in well MW2 in September 1997.
- January 1992: A fracture was discovered in the 8,000-gallon gasoline UST and the UST was repaired.
- March 1992: Sierra Environmental Services, Inc. (SES) drilled five soil borings and installed groundwater monitoring wells MW5 through MW8. Well MW4 (B6) was not installed because of the presence of an underground utility.
- July 1993: The four USTs were removed and replaced with one 15,000-gallon and one 12,000-gallon double-walled fiberglass USTs. Approximately 550 cubic yards (yd^3) of soil excavated during UST removal and an additional 560 yd^3 of hydrocarbon-impacted soil were excavated and transported to an appropriate disposal facility. The approximate limits of the excavation are depicted on Plate 2. Laboratory analysis of confirmation soil samples collected from the limits of the UST cavity excavation detected concentrations of TPHg up to 1,800 milligrams per kilogram (mg/Kg); TPHd up to 43 mg/Kg; and benzene 0.34 mg/Kg.
- February 1994: Groundwater monitoring wells MW4 and MW9 and soil vapor extraction (SVE) wells V1 through V4 were installed.
- February 1994: Redwood removed one 250-gallon waste-oil UST. The UST had approximately 10 holes.
- April 1994: Redwood removed one 900-gallon concrete septic tank and one 3,000-gallon metal overflow tank.

- In 1995: Redwood installed a soil vapor extraction/groundwater extraction (SVE/GWE) remediation system.
- August 1995: GWE system operation was initiated.
- September 15, 1995: SES conducted SVE test and submitted the results to the Bay Area Air Quality Management District (BAAQMD) for approval to discharge under BAAQMD Permit Application No. 12730. The revised test results were submitted to the BAAQMD on December 11, 1995.
- March 25, 1996: SES observed destruction of one on-site groundwater production well. The well was located on the southwest corner of the site and consisted of an 8-inch diameter, 72.5 feet deep casing (74 feet below ground surface [fbgs]). Water was measured at 7.5 feet below the top of casing (TOC [approximately 1.5 fbgs]). Analysis of a groundwater sample collected from this well detected 10,000 ppb TPHg and 630 ppb benzene.
- Early 1998: ECM Group (ECM) assumed environmental consulting responsibilities for the site.
- May 7, 1999: Well MW5 was destroyed to accommodate roadway improvements.
- October 1999 and March 2000: Groundwater monitoring well MW10 was installed and borings B7 through B9 were drilled.
- December 15, 2000: Redwood received correspondence from the City of Santa Rosa Utilities Department regarding the proposed Wastewater Discharge Permit No. SR-GW5287 to discharge treated groundwater to the City facilities.
- January 2001: Well MW6 was destroyed to accommodate roadway improvements.
- August 2001: Groundwater monitoring well MW11 was installed.
- March 2002: Three cone penetrometer test (CPT) borings were advanced to approximately 100 fbgs to collect depth specific groundwater samples and assess the vertical extent of dissolved-phase hydrocarbons in groundwater. Results of laboratory analysis of groundwater samples collected from the CPT borings indicated concentrations of dissolved-phase TPHd and TPHg were present to the maximum depth explored (approximately 100 fbgs). Groundwater samples were not analyzed for MTBE.
- 2004: Semi-annual groundwater monitoring and sampling were initiated (second and fourth quarters, ECM-ERI respectively).
- October 2004: ERI assumed consulting responsibilities at the site. The remediation system was shut down because hydrocarbon removal rates revealed that GWE is not an appropriate or cost-effective technology to remove dissolved-phase hydrocarbons and related compounds currently detected in groundwater beneath the site. Subsequent groundwater monitoring and sampling events indicated TPHg, benzene, and TPHd concentrations in groundwater were increasing while MTBE concentrations remained below or equal to 5.9 micrograms per liter ($\mu\text{g}/\text{L}$).
- January 2005: Redwood received correspondence from the Regional Board expressing concern regarding MTBE detected in domestic wells located north and east of the site. The Regional Board requested Redwood collect monthly samples from these wells and prepare a Work Plan for further groundwater assessment.

- January 2005: ERI obtained access agreements from domestic well owners and initiated monthly groundwater sampling.
- January/February 2005: ERI performed a 5-day source removal test. Approximately 138 pounds of TPHg and 1.1 pounds of MTBE were removed.
- March 2005: ERI submitted a Work Plan to perform additional assessment beneath and in the vicinity of the site, utilizing CPT technology.
- June 2005: ERI performed a CPT study at the site. ERI also obtained CPT data for the Redwood site from Gregg Drilling, Inc., and CPT data for the Shell-branded site from the Regional Board.
- May-October 2005: ERI coordinated and Redwood facilitated installation of well head treatment systems on domestic wells located at 2050 and 2075 Marlow Road and 1815 Guerneville Road in Santa Rosa.
- November 2005: ERI submitted the *Supplemental Evaluation of Groundwater and Domestic Well Head Treatment System Installation report* (November 5, 2005), summarizing the data from the CPT evaluation.

Currently there are nine groundwater monitoring wells (MW1 through MW4 and MW7 through MW11) screened within the upper-water bearing zone (A Zone) (to 30 fbs and 40 fbs [MW3]); four vapor extraction wells (V1, V2, V3, V4); and select GWE system components associated with environmental activities at the site (Plate 2).

3.0 SUMMARY OF SITE CONDITIONS

3.1 Site Geology

The site is underlain by Holocene and Pleistocene heterogeneous alluvial deposits consisting of sand, clay, and silt (Herbst, et al, 1982).

Sediment observed in borings advanced in vadose soil and the upper saturated zone (approximately 30 to 40 fbs) beneath and in the vicinity of the site generally consists of heterogeneous clays, silts, sands, and gravels.

Sediment encountered in CPT borings associated with the site (CPT1 through CPT7) is similar to sediment previously described and is interpreted as heterogeneous silt, clayey silt, sandy silt, silty sand, sand, and gravelly sand. Cross section A-A' is provided on Plate 3. The trace of cross section A-A' is shown on Plate 4. Based on the vertical CPT profiles, ERI has identified four depth intervals in which relatively coarse-grained sediment layers (sand, gravelly sand, silty sand) predominate; appear laterally continuous within the upper shallow zone (5 to 20 fbs); and pinch out in the lower zones. These coarse-grained intervals appear best developed and correlatable beneath the Shell-branded station west of the subject site. The coarse-grained layers detected under the subject site appear thinner than those under the Shell-branded site, and the correlatable units appear at slightly greater depths.

Pervious assessments associated with the Shell-branded service station west of the site identified four water-bearing zones designated as Zone A, Zone B, Zone C, and Zone D. The shallow saturated zone beneath the Redwood site generally corresponds to Zone A beneath the Shell-branded service station.

3.2 Site Hydrogeology

Based on CPT pore dissipation tests, the static groundwater surface in borings CPT4 through CPT7 occurred at approximately 5 to 6 fbgs during June 2005, and the deeper units are hydraulically connected vertically with each other and with shallower groundwater.

The depth to groundwater beneath the site in the upper saturated zone (Zone A) has historically ranged between approximately 3 to 15 feet bgs. The groundwater flow direction has been variable, but generally towards the northeast since GWE was discontinued in October 2004. Groundwater elevation maps for April 6, 2004, April 22, 2005, and March 8, 2006 are provided in Appendix B.

3.3 Distribution of Residual Hydrocarbons in Soil

Based on the cumulative results of laboratory analyses of soil samples collected during assessment activities on the Redwood site, residual hydrocarbons in vadose soil are adequately delineated. Residual hydrocarbons in vadose soil appear to be concentrated in the vicinity of the former USTs, particularly along the northern sidewall and to the north and northwest of the former UST cavity, and to a lesser extent along the eastern sidewall and south and southeast of the former UST cavity. Analysis of soil samples collected from the northwestern sidewall of the former UST cavity detected TPHg at concentrations of 1,800 ppm; in the northeast corner of the former UST cavity (soil borings MW7 and SB2) at concentrations of 860 and 313 ppm, respectively; and to the west of the northern portion of the former UST cavity (boring MW2) at concentrations of 392 ppm. In addition, soil samples collected from beneath former product lines PL1 and PL2, north of the former USTs detected TPHg at concentrations of 1,050 ppm and benzene at concentrations of 14.2 ppm. No confirmation soil samples have been collected following completion of SVE remediation activities performed at the site. Soil sample locations and the cumulative analytical results of soil samples are provided as Appendix C.

3.4 Distribution of Separate-Phase Hydrocarbons

Separate-phase fuel hydrocarbons were detected in well MW2 when it was installed in 1989. A passive product recovery skimmer was installed in well MW2 on November 8, 1992. During the period of passive recovery, no SPHs were recovered from well MW2. Separate-phase hydrocarbons were last detected in well MW2 in September 1997 (ECM; June 2002).

3.5 Distribution of Dissolved-Phase Hydrocarbons

Dissolved-phase hydrocarbons and related constituents in groundwater in the upper water-bearing zone (Zone A) appear to be concentrated downgradient of the former USTs near wells MW2, MW7, and MW9. Cumulative results of laboratory analyses of groundwater samples collected from groundwater monitoring wells during quarterly monitoring and sampling events are provided in Appendix D. Benzene, TPHg, TPHd, and MTBE isoconcentration maps for wells associated with the site are provided in Appendix E for three dates: 1) during active groundwater remediation while the system wells were pumping (April 6, 2004); 2) at the peak rebound of concentrations of constituents of concern (COCs) (April 22, 2005); and; 3) during the most recent quarterly monitoring and sampling event (March 8, 2006).

Review of the three sets of isoconcentration maps and historical groundwater monitoring data indicates that the dissolved-phase hydrocarbon plume is centered near wells MW7 and MW9, and extends towards well MW10, and beyond wells MW3, MW4, MW8, and MW11. Previous remedial efforts appeared to have reduced the size of the plume as shown on the April 6, 2004, isoconcentration maps. Following shutdown of the groundwater remediation system in October 2004, concentrations of COCs rebounded and the plume increased in lateral extent as groundwater elevation increased to pre-GWE levels. Peak rebound concentrations are shown on the April 22, 2005, isoconcentration maps. During first quarter 2006, dissolved-phase hydrocarbon concentrations in well MW7 were 4,300 µg/L TPHg; less than 400 µg/L TPHd; 130 µg/L benzene; and 5.9 µg/L MTBE.

4.0 SUMMARY OF REMEDIAL ACTIONS

4.1 Soil Vapor Extraction System

In 1995, a SVE system was installed at the site. The SVE system consisted of four SVE wells (V1 through V4), associated conveyance piping, a vacuum blower, and a thermal/catalytic oxidizer for abatement. Operation of the SVE system was initiated in September 1995 and continued through April 1997. Due to noise generated by the blower, the system operated 8 hours per day during daylight hours. There were two shut down periods to facilitate system maintenance and modifications. Total operation time for the SVE system was 14 months. The peak influent vapor concentration during system operation was 1,200 parts per million by volume (ppmv). Over the following 9 months of operation, the average influent vapor concentration was reduced to 970 ppmv, at which point ECM Group shut the system down, citing that thermal oxidation was no longer an efficient remedial technology. The SVE system removed 7,204 pounds of hydrocarbons during the 14 months of operation (ECM, June 19, 1998).

4.2 Groundwater Extraction System

The GWE system was installed at the site in 1995. Conveyance piping was connected to wells MW1 through MW4 and MW7 through MW9, although groundwater extraction pumps were only installed in wells MW1 through MW3, MW7, and MW8. The system consisted of an air compressor, pneumatic well pumps, a particulate filter, and two 1,000 pound carbon vessels containing granular activated carbon (GAC), arranged in series. A holding tank was installed at a later date. The GWE system operation commenced in 1995 and continued through October 2004. ERI shut the system down in October 2004 because hydrocarbon removal rates revealed that GWE is not a cost effective technology to remove dissolved-phase hydrocarbons and related compounds detected in groundwater beneath the site. Since October 2004, the system has been operated intermittently to treat waste water generated during a 5-day source removal test during January/February 2005 and purge water from ongoing semi-annual groundwater monitoring and sampling performed at the site. Through April 22, 2006, the GWE system has extracted and treated 3,184,358 gallons of groundwater, and removed 32.11 pounds of TPHg, and 1.03 pounds of MTBE. Operation and performance data for the GWE system is provided in Appendix F.

5.0 REMEDIAL ALTERNATIVES

ERI evaluated three remedial alternatives for this CAP: 1) soil excavation; 2) groundwater extraction and treatment; and 3) two phase extraction.

5.1 Excavation

ERI evaluated removal of soil by excavation, and rejected this alternative because: 1) excavation of approximately 1,110 yd³ of hydrocarbon-impacted soil from the site during the July 1993 UST replacement activities failed to address the presence of residual hydrocarbons remaining in the saturated zone (as exhibited in increases in dissolved-phase hydrocarbons in shallow groundwater as groundwater elevations rebounded to pre-GWE levels); 2) it fails to address dissolved-phase hydrocarbons in shallow groundwater; and 3) requires temporary facility closure disrupting the operating business at the site. Implementation of this alternative may exceed \$150,000 and still require additional remediation efforts for residual-phase hydrocarbons in the saturated zone and dissolved-phase hydrocarbons in groundwater.

5.2 Groundwater Extraction and Treatment

Groundwater extraction and treatment (GET) involves pumping impacted groundwater from one or more groundwater extraction wells, treatment of groundwater aboveground, and discharge into the sanitary sewer under a local agency permit. Groundwater extraction is used for constituent mass removal and hydraulic control of hydrocarbon-impacted groundwater. GET has been used at the site as the primary remedial method since 1995. Historical data from the site indicate that GET does not appear to be an

effective remedial alternative for this site, as groundwater extraction alone will not cost-effectively address the presence of residual hydrocarbons in the saturated zone within a realistic time frame. Implementation of this alternative will be approximately \$10,000 for existing system upgrades and an estimated \$360,000 for 12 years of operation and maintenance.

5.3 Two-Phase Extraction

Two-phase extraction uses SVE and GWE technologies simultaneously. The GWE system draws down the water table exposing residual hydrocarbons remaining in the saturated zone while the SVE system extracts and treats soil vapor from the exposed impacted soil, and enhances biodegradation. Two-phase extraction appears to be an effective remedial alternative for this site, as it will address hydrocarbon-impacted soil and groundwater in both the saturated and vadose zones in an effective and timely manner and can incorporate many of the GWE remediation system components already in place at the site. Capitol costs associated with implementation are approximately \$55,000. With estimated operation and maintenance costs of approximately \$70,000 over approximately 11 months.

6.0 PROPOSED CORRECTIVE ACTION

6.1 Two-Phase Extraction

Based on historical groundwater monitoring data, current concentrations of dissolved-phase hydrocarbons and related constituents, cumulative results of environmental activities, and the evaluation of several remedial alternatives, ERI recommends implementing two-phase extraction at the site to address residual hydrocarbons in vadose soil and in the shallow saturated zone (Zone A) beneath the site and hydrocarbon impacted shallow groundwater beneath and in the vicinity of the site. In addition, as previously discussed, many of the two-phase extraction system components and infrastructure are currently in place from earlier remediation efforts and remain operable. It appears that two-phase extraction will be the most cost-effective technology for remediating the site, and most capable of decreasing residual-phase and dissolved-phase concentrations to levels consistent with conservative water quality goals.

6.1.1 System Description

ERI proposes to retrofit the existing GWE system using the existing remediation compound, GWE equipment, and electrical service. ERI proposes to install a 10-horsepower (hp) two-stage regenerative blower for SVE, a vacuum receiver tank with level controls and a transfer pump, two 1,000-pound capacity vapor-phase carbon vessels plumbed in series, for vapor abatement, and a control panel. The system will be integrated with the existing well pump compressor, pneumatic groundwater pumps, holding tank, transfer pump, liquid-phase carbon vessels, and sump pump. Wells MW1, MW2, MW3, MW7, MW8, and MW9 and associated conduits will be retrofitted to allow vacuum to be applied to the wells while operating the submersible groundwater pumps, thus allowing two-phase extraction to be implemented on all the existing wells with down-hole pumps. Well MW9 does not currently have a groundwater pump installed, therefore it will be used solely as an SVE well. In addition, existing vapor extraction wells V1, V2, V3, and V4 will be connected to the SVE portion of the system.

ERI estimates the total cost for the labor and materials to complete the retrofit of the existing system to be approximately \$55,000. This estimate is based on the assumption that all current underground facilities associated with the existing remediation system (wells, groundwater pumps; piping, lines, etc.) are intact, undamaged, and functioning.

6.2 Schedule of Implementation

ERI has applied for and received Groundwater Discharge Permit No. GW5287, from the City of Santa Rosa Utilities Department. The groundwater discharge permit expires on December 28, 2010. ERI submitted has also applied for and received the application for an Authority to Construct/Permit to Operate an SVE System (ATC/PTO) form the BAAQMD. ERI plans to commence construction activities during April 2006. The duration of construction is estimated to last approximately three weeks. ERI anticipates system startup and shakedown activities on the retrofitted two phase extraction system will occur during May 2006. If any operational problems are encountered during the startup/shakedown process, they will be addressed immediately upon discovery. Within 7 days of completion of startup/shakedown completion, ERI will initiate full time operation of the retrofitted system in compliance with both the groundwater discharge and ATC/PTO permits.

7.0 LIMITATIONS

This CAP was prepared in accordance with generally accepted standards of environmental practice in California at the time this investigation was performed. This investigation was conducted solely for the purpose of evaluating environmental conditions of the soil and first-encountered groundwater. No soil engineering or geotechnical references are implied or should be inferred. Evaluation of the geologic conditions at the site for the purpose of this investigation is made from a limited number of observation points. Subsurface conditions may vary away from the data points available. Additional work, including further subsurface investigation, can reduce the inherent uncertainties associated with this type of investigation. This report has been prepared solely for Redwood Oil Company, and any reliance on this report by third parties shall be at such party's sole risk.

8.0 REFERENCES

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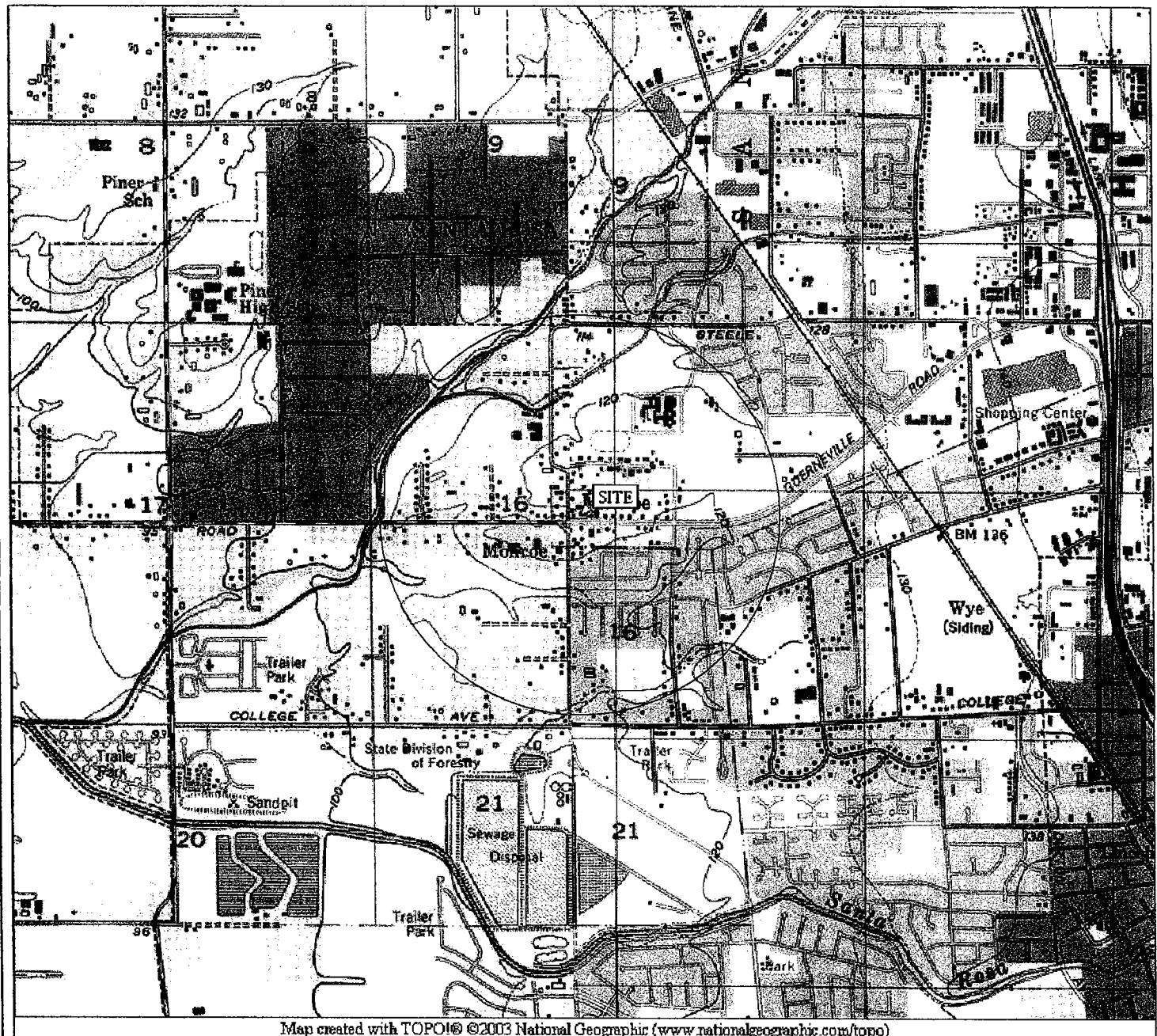
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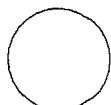
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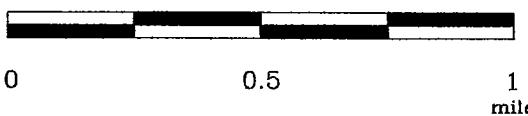
FN 2619TOPO

EXPLANATION



1/2-mile radius circle

APPROXIMATE SCALE



SOURCE:
Modified from a map
provided by
DeLorme 3-D TopoQuads



SITE VICINITY MAP

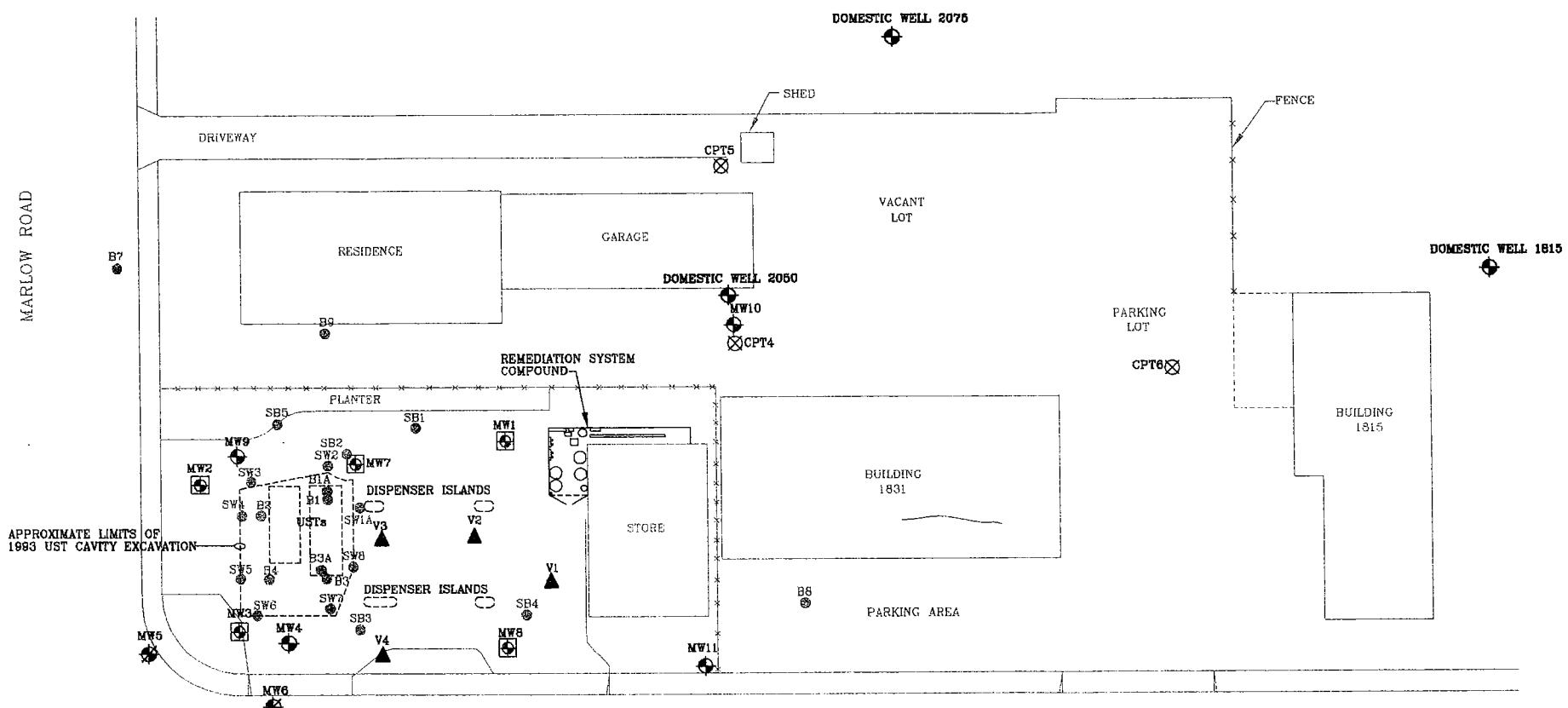
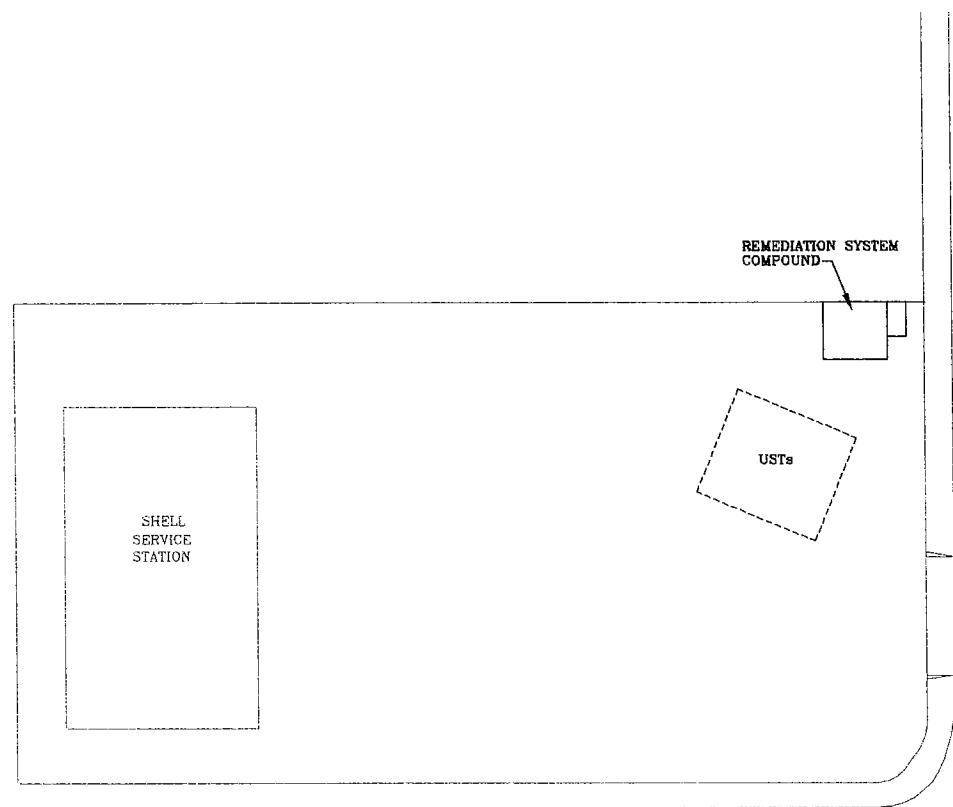
REDWOOD OIL FACILITY 114
1855 Guerneville Road
Santa Rosa, California

PROJECT NO.

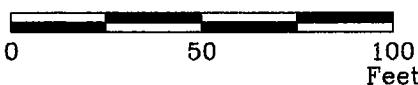
2619

PLATE

1



APPROXIMATE SCALE



FN 26190001



GENERALIZED SITE PLAN

REDWOOD OIL FACILITY 114
1855 Guerneville Road
Santa Rosa, California

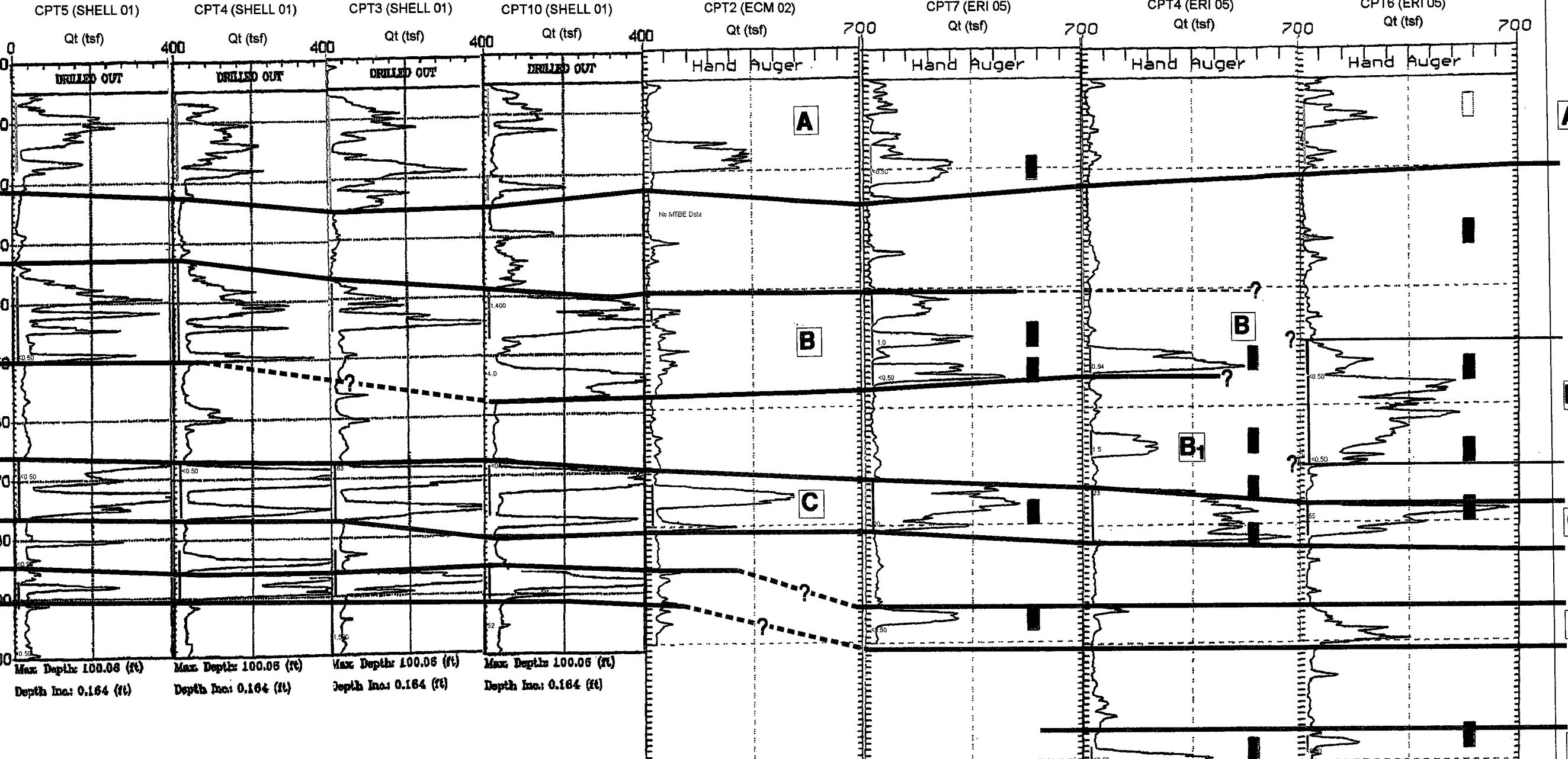
EXPLANATION

- MW11 Groundwater Monitoring Well
- MW8 Groundwater Recovery Well
- MW6 Destroyed Groundwater Monitoring Well
- CPT6 Proposed Cone Penetrometer (CPT)
- B8 Soil Boring
- SVE4 Soil Vapor Extraction Well

PROJECT NO.

2619

PLATE
2

A

55 MTBE Concentration (microgram per liter)

E Zone Designation**■** Groundwater Sample**□** No Recovery

FN 2619 MTBE XS_SP

NOT TO SCALE



CPT CROSS SECTION A-A' AND MTBE CONCENTRATIONS

REDWOOD OIL FACILITY 114
1855 Guerneville Road
Santa Rosa, California

REFERENCES

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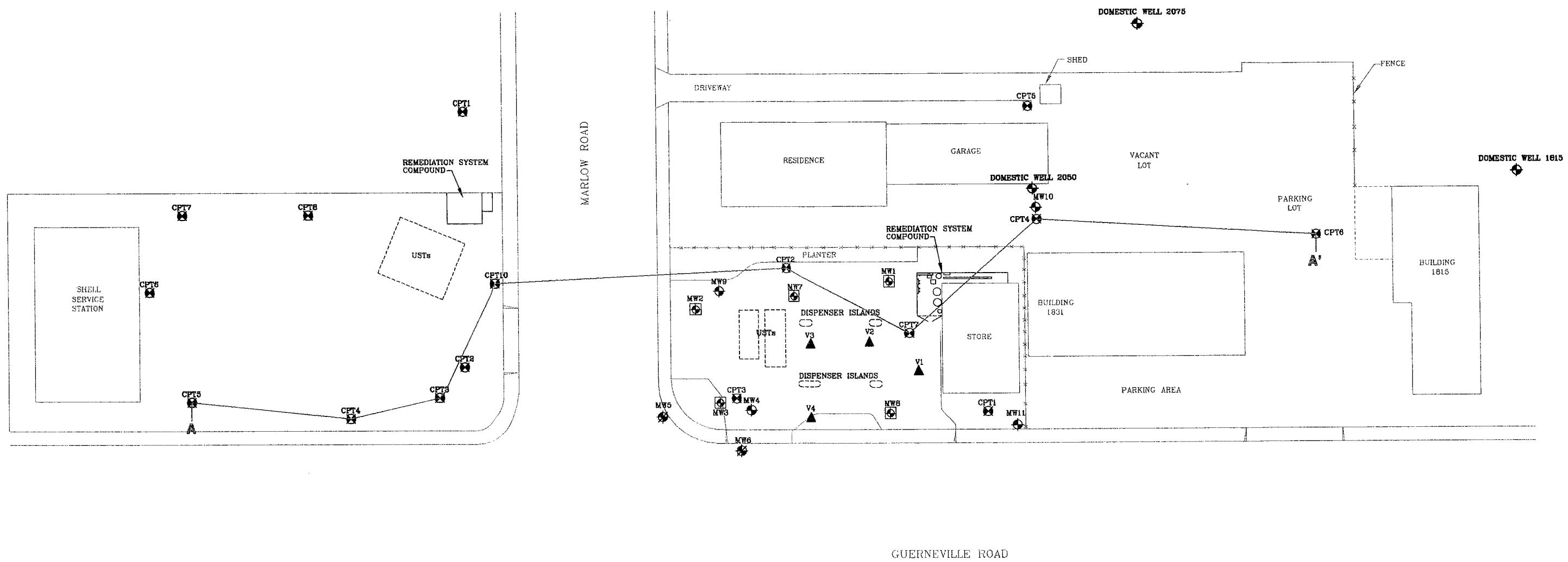
PROJECT NO.

2619

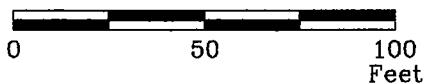
PLATE

3

N



APPROXIMATE SCALE



FN 26190001_SP

A A' Cross Section Location



CPT CROSS SECTION LOCATION MAP

REDWOOD OIL FACILITY 114
1855 Guerneville Road
Santa Rosa, California

EXPLANATION

- Domestic Well
- Groundwater Monitoring Well
- Groundwater Recovery Well
- Destroyed Groundwater Monitoring Well
- Cone Penetrometer (CPT)
- Cone Penetrometer - CPT (Shell 2002)
- Soil Vapor Extraction Well

PROJECT NO.
2619
PLATE
4

APPENDIX A

REGULATORY CORRESPONDENCE



California Regional Water Quality Control Board
North Coast Region
Beverly Wasson, Chairperson

Alan C. Lloyd, Ph.D.
Agency Secretary

www.waterboards.ca.gov/northcoast
5550 Skylane Boulevard, Suite A, Santa Rosa, California 95403
Phone: (877) 721-9203 (toll free) • Office: (707) 576-2220 • FAX: (707) 523-0135



Arnold Schwarzenegger
Governor

January 10, 2006

Mr. Robert Barbieri
Mr. Peter Van Alyea
Redwood Oil Company
P.O. Box 428
Santa Rosa, CA 95402

RECEIVED
JAN 12 2006
BY:

Gentlemen:

Subject: Comments on Supplemental Evaluation of Groundwater and Domestic Well Head Treatment System Installation
File: Redwood Oil #114, 1855 Guerneville Road, Santa Rosa, Case No. 1TSR088

Regional Water Board staff have reviewed the November 3, 2005 *Supplemental Evaluation of Groundwater and Domestic Well Head Treatment System Installation* prepared by Environmental Resolutions, Inc. (ERI) for 1855 Guerneville Road in Santa Rosa. Regional Water Board staff comments are:

- We concur with the ERI recommendation to evaluate alternatives to remediate residual and dissolved-phase hydrocarbons remaining in soil and shallow groundwater beneath the site. Cleanup alternatives must be considered for all site contaminants, including Methyl tertiary Butyl Ether (MtBE).
- Evidence was not provided to show that the source of MtBE originated from an off site source.
- A groundwater monitoring well network must be established for the deeper water bearing zone impacts. Remediation for deeper water bearing zones will then be evaluated based on the results.
- Water supply well sampling must continue on a monthly schedule.

We look forward to receipt of a Corrective Action Plan addendum to address the shallow impacts and a work plan for the installation of a ground water monitoring well network for the deeper impacted zones within 60 days of issuance of this letter. If you have any questions I can be reached at (707) 576-2675.

Sincerely,

Joan Fleck
Engineering Geologist

California Environmental Protection Agency

Recycled Paper

Mr. Robert Barbieri
Mr. Peter Van Alyea

-2-

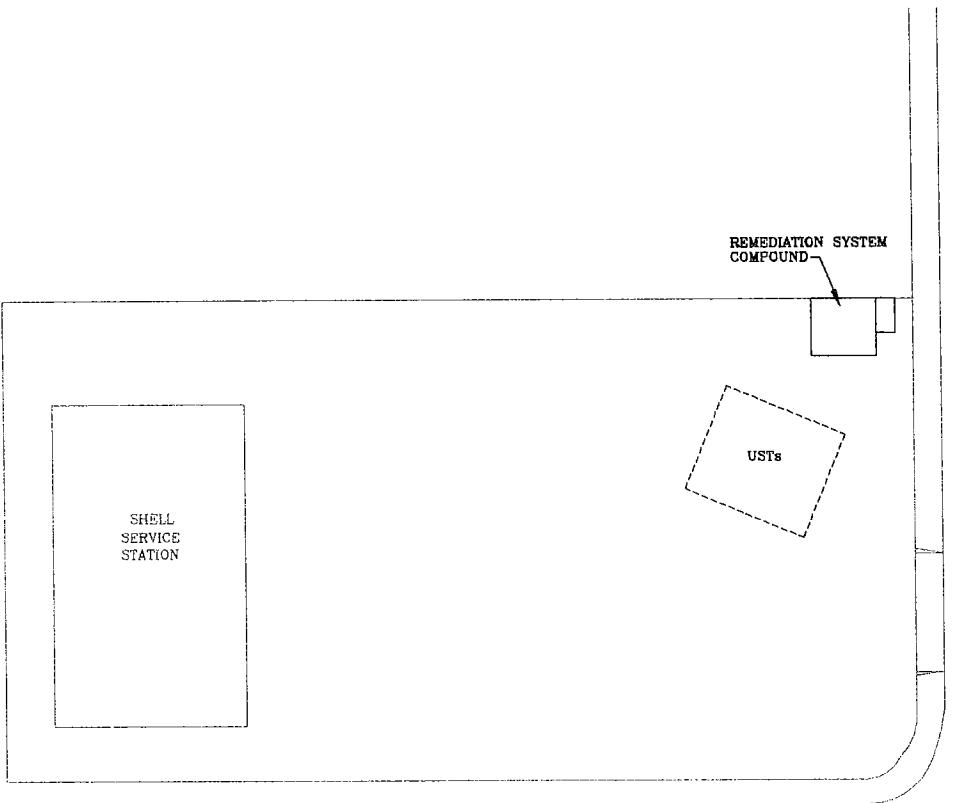
January 10, 2006

011006_JEF_RedOil

cc: Mr. Glenn Matteucci, Environmental Resolutions, Inc. 601 North McDowell Boulevard,
Petaluma, CA 94954
Ms. Corey Vincent, Santa Rosa Fire Department
Ms. Judy Emis, P.O. Box 18, Mount Angel, Oregon, 97362
Ms. Christine Emis, 2075 Marlow Road, Santa Rosa, CA 95401
The Callison Family, 2050 Marlow Road, Santa Rosa, CA 95401

APPENDIX B

GROUNDWATER ELEVATION MAPS
(APRIL 6, 2004, APRIL 22, 2005, MARCH 8, 2006)



APPROXIMATE SCALE

A horizontal scale bar with three tick marks. The first tick mark is labeled "0". The second tick mark is labeled "50". The third tick mark is labeled "100 Feet".

FN 26190001



GROUNDWATER ELEVATION MAP

April 6, 2004

REDWOOD OIL FACILITY 114
1855 Guerneville Road
Santa Rosa, California

EXPLANATION

MW11
+ Groundwater Monitoring Well

118.61. *Synaptosomal amyloid beta*

118.91 Groundwater elevation in feet;
datum is mean sea level.

W8MW

 Groundwater Recovery Well

MW6 Postcapped Groundwater Monitoring Well

SVE4

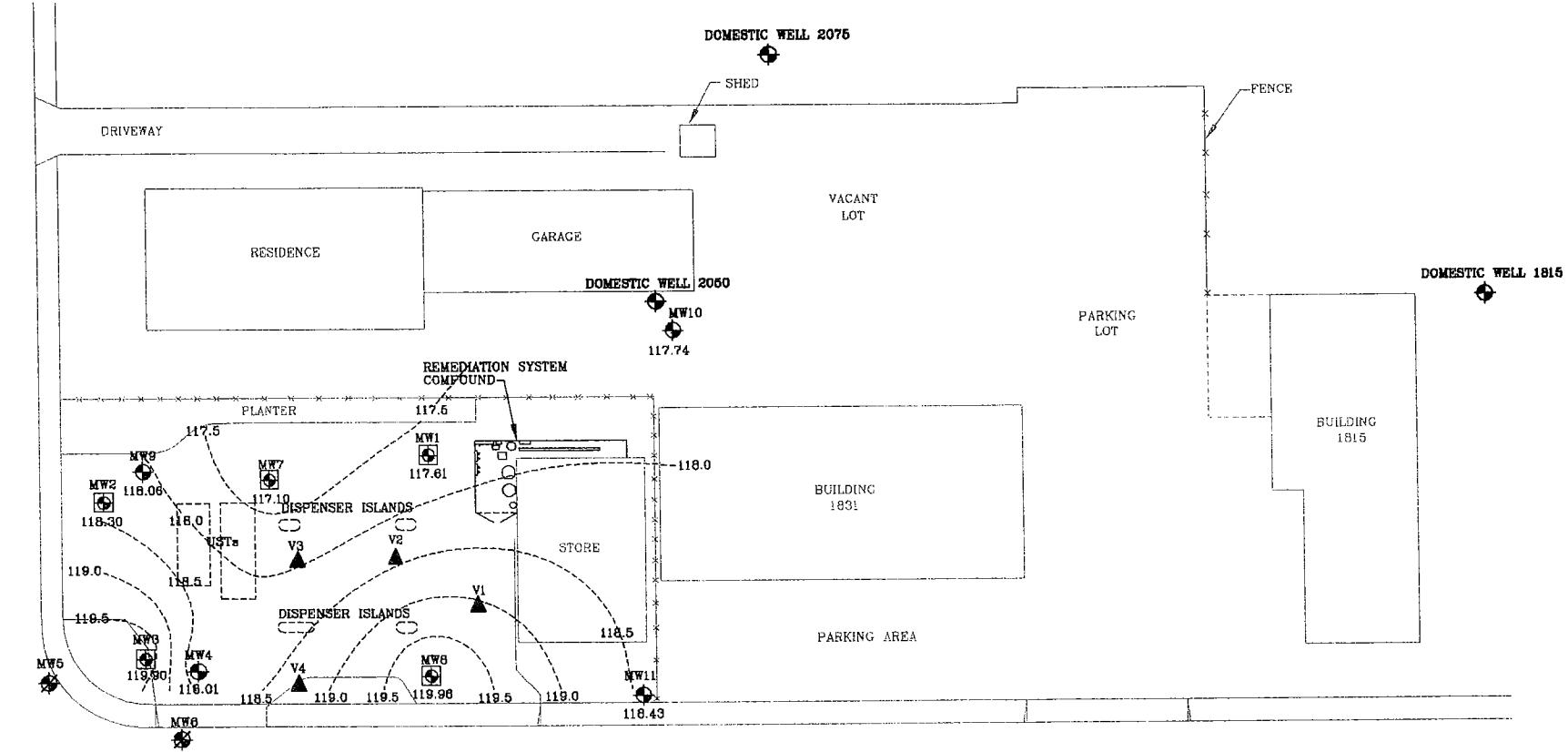
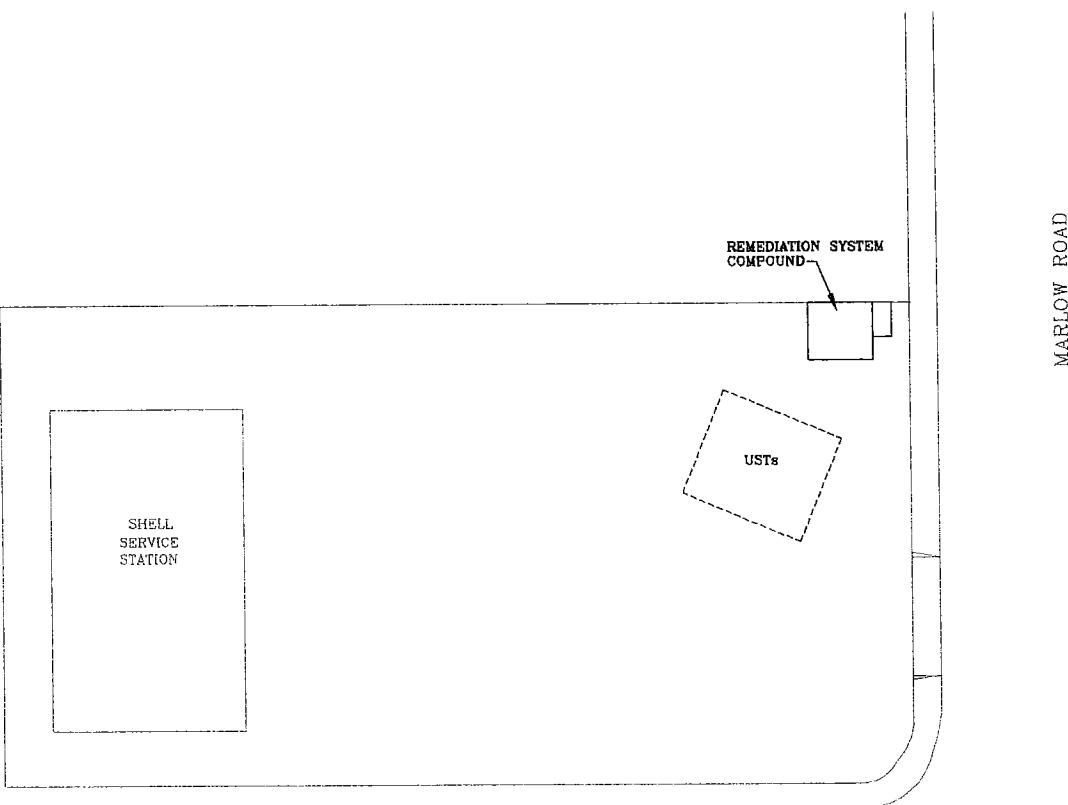
▲ Soil Vapor Extraction Well

PROJECT NO.

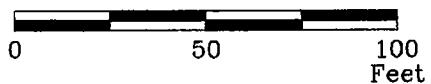
APPENDIX

B-1

N



APPROXIMATE SCALE



FN 26190001_QM



GROUNDWATER ELEVATION MAP
April 22, 2005
REDWOOD OIL FACILITY 114
1855 Guerneville Road
Santa Rosa, California

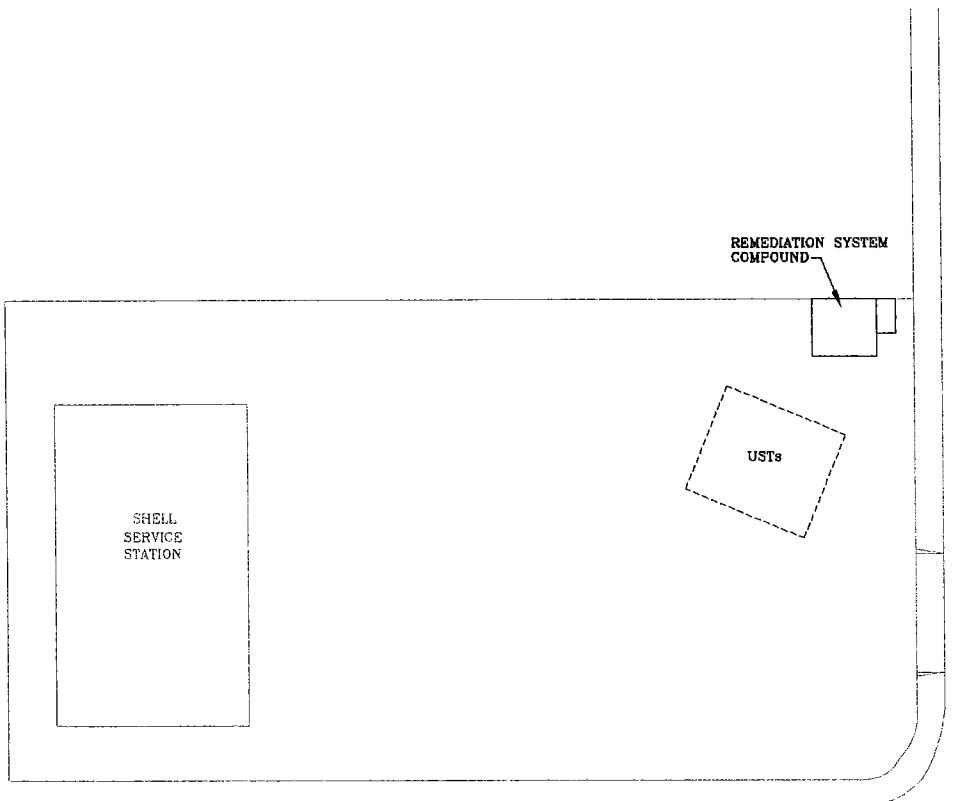
EXPLANATION

- MW11 Groundwater Monitoring Well
- 118.43 Groundwater elevation in feet; datum is mean sea level
- MW8 Groundwater Recovery Well
- MW6 Destroyed Groundwater Monitoring Well

119.5----- Line of Equal Groundwater Elevation;
datum is mean sea level

- SVE4 Soil Vapor Extraction Well

PROJECT NO.
2619
APPENDIX
B-2



APPROXIMATE SCALE

FN 26190001_QM



GROUNDWATER ELEVATION MAP

March 8, 2006

REDWOOD OIL FACILITY 114
1855 Guerneville Road
Santa Rosa, California

EXPLANATION

- MW11 Groundwater Monitoring Well
 120.73 Groundwater elevation in feet;
 datum is mean sea level

MW8 Groundwater Recovery Well
 MW6
 Destroyed Groundwater Monitoring Well

Domestic Well
(With Well Head Treatment System)
121.0-----Line of Equal Groundwater Elevation;
datum is mean sea level

- SVE4**

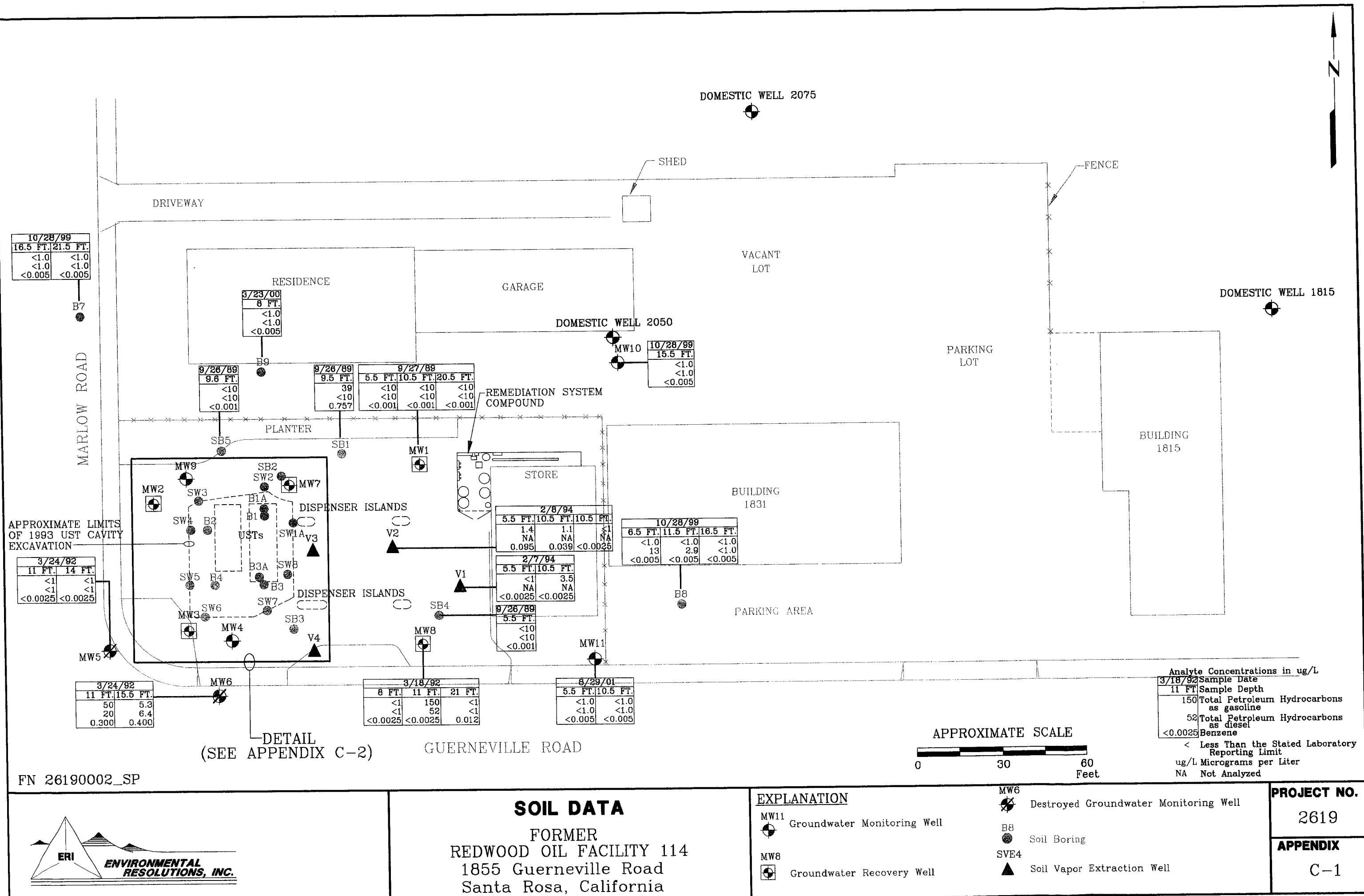
PROJECT NO.
2619

APPENDIX

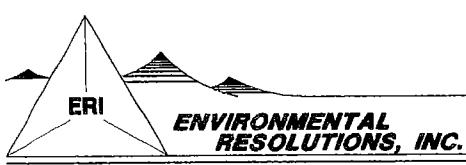
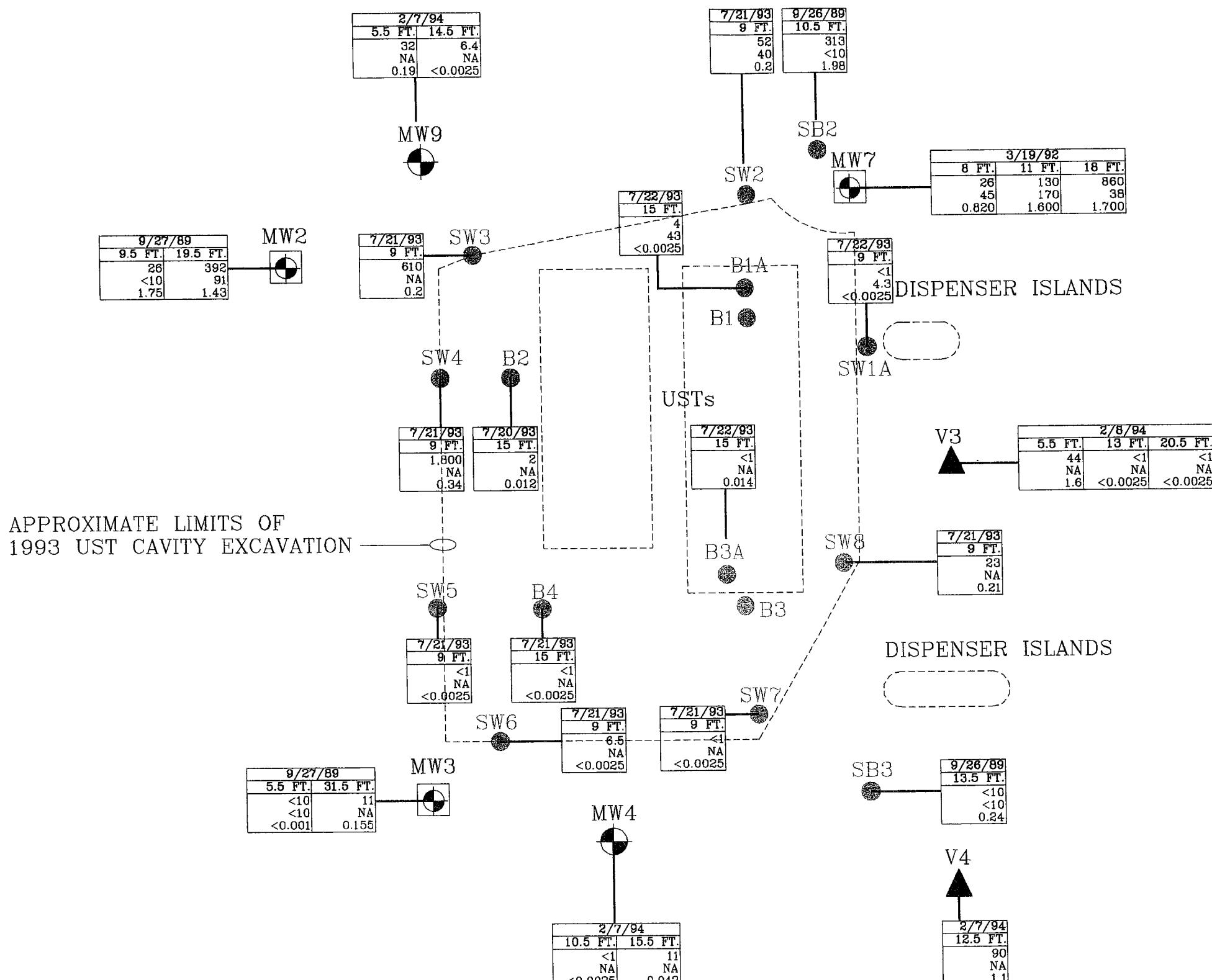
B-3

APPENDIX C

SAMPLE LOCATIONS AND CUMULATIVE ANALYTICAL RESULTS OF SOIL SAMPLES



N



SOIL DATA

FORMER
REDWOOD OIL FACILITY 114
1855 Guerneville Road
Santa Rosa, California

EXPLANATION

- MW11 Groundwater Monitoring Well
- MW8 Groundwater Recovery Well
- B8 Soil Boring
- SVE4 Soil Vapor Extraction Well

Cumulative Analytical Results of Soil Samples
 Redwood Oil Company Facility #114, 1855 Guerneville Road, Santa Rosa, California

Cumulative Soil Data								Ethyl			Organic	
Name	DATE	DEPTH	TPHg	TPHd	Benzene	Motor Oil	Toluene	Benzene	Xylenes	Lead	Lead	MTBE
MW1	09/27/89	5.5	<10	<10	<0.001	<10	<0.001	<0.001	<0.001	--	<0.05	--
MW1	09/27/89	10.5	<10	<10	<0.001	<10	<0.001	<0.001	<0.001	--	<0.05	--
MW1	09/27/89	20.5	<10	<10	<0.001	<10	<0.001	<0.001	<0.001	--	<0.05	--
MW2	9/27/89	9.5	26	<10	1.75	<10	12.5	5.36	32.9	--	<0.05	--
MW2	9/27/89	19.5	392	91	1.43	<10	37.7	13.6	96.2	--	<0.05	--
MW3	9/27/89	5.5	<10	<10	<0.001	<10	<0.001	<0.001	<0.001	--	<0.05	--
MW3	9/27/89	31.5	11	--	0.155	<10	0.155	0.27	2.02	--	<0.05	--
SB-1	09/26/89	9.5	39	<10	0.757	<10	2.02	0.339	2.16	--	<0.05	--
SB-2	09/26/89	10.5	313	<10	1.98	<10	29.2	10.6	63	--	<0.05	--
SB-3	09/26/89	13.5	<10	<10	0.24	<10	<0.001	<0.001	<0.001	--	<0.05	--
SB-4	09/26/89	5.5	<10	<10	<0.001	<10	<0.001	<0.001	<0.001	--	<0.05	--
SB-5	09/26/89	9.6	<10	<10	<0.001	<10	<0.001	<0.001	<0.001	--	<0.05	--
MW5	3/24/92	11	<1	<1	<0.0025	--	<0.0025	<0.0025	0.0055	2.8	--	--
MW5	3/24/92	14	<1	<1	<0.0025	--	<0.0025	<0.0025	0.0039	4.2	--	--
MW6	3/24/92	11	50	20	0.300	--	0.300	0.26	1.2	4.9	--	--
MW6	3/24/92	15.5	5.3	6.4	0.400	--	0.400	0.15	0.45	4.3	--	--
MW7	3/19/92	8	26	45	0.820	--	0.820	0.21	0.84	4.8	--	--
MW7	3/19/92	11	130	170	1.600	--	1.600	2.9	13	5	--	--
MW7	3/19/92	18	860	38	1.700	--	1.700	8200	32	5.1	--	--
MW8	3/18/92	8	<1	<1	<0.0025	--	<0.0025	<0.0025	<0.0025	4.2	--	--
MW8	3/18/92	11	150	52	<0.0025	--	<0.0025	0.3	<0.0025	4.3	--	--
MW8	3/18/92	21	<1	<1	0.012	--	0.012	<0.0025	1.2	4.3	--	--
B-1A	7/22/1993	15	4	43	<0.0025	--	0.005	0.0092	0.14	--	--	--
B-2	7/20/1993	15	2	---	0.012	--	<0.0025	0.016	0.01	--	--	--
B-3A	7/22/1993	15	<1	---	0.014	--	0.003	0.031	0.075	--	--	--
B-4	7/21/1993	15	<1	---	<0.0025	--	<0.0025	0.011	<0.0025	--	--	--
SW-1A	7/22/1993	9	<1	4.3	<0.0025	--	<0.0025	<0.0025	0.0076	--	--	--
SW-2	7/21/1993	9	52	40	0.2	--	<0.0025	0.045	0.072	--	--	--
SW-3	7/21/1993	9	610	---	0.2	--	1.700	0.47	8.5	--	--	--
SW-4	7/21/1993	9	1800	---	0.34	--	3.600	4.4	37	--	--	--
SW-5	7/21/1993	9	<1	---	<0.0025	--	<0.0025	<0.0025	<0.0025	--	--	--
SW-6	7/21/1993	9	6.5	---	<0.0025	--	<0.0025	<0.0025	0.091	--	--	--
SW-7	7/21/1993	9	<1	---	<0.0025	--	<0.0025	<0.0025	<0.0025	--	--	--
SW-8	7/21/1993	9	23	---	0.21	--	<0.025	0.1	0.2			

Cumulative Analytical Results of Soil Samples
 Redwood Oil Company Facility #114, 1855 Guerneville Road, Santa Rosa, California

Cumulative Soil Data								Ethyl			Organic	
	DATE	DEPTH	TPHg	TPHd	Benzene	Motor Oil	Toluene	Benzene	Xylenes	Lead	Lead	MTBE
Name			ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
MW4	2/7/94	10.5	<1	--	<0.0025	--	<0.0025	<0.0025	<0.0025	--	<0.05	--
MW4	2/7/94	15.5	11	--	0.042	--	0.042	0.062	0.17	--	--	--
MW9	2/7/94	5.5	32	--	0.19	--	0.120	0.28	1.2	--	--	--
MW9	2/7/94	14.5	6.4	--	<0.0025	--	0.023	0.019	0.072	--	--	--
V1	2/7/94	5.5	<1	--	<0.0025	--	<0.0025	<0.0025	<0.0025	--	--	--
V1	2/7/94	10.5	3.5	--	<0.0025	--	<0.0025	0.014	<0.0025	--	--	--
V2	2/8/94	5.5	1.4	--	0.095	--	<0.0025	0.033	0.0037	--	--	--
V2	2/8/94	10.5	1.1	--	0.039	--	<0.0025	<0.0025	<0.0025	--	--	--
V2	2/8/94	15.5	<1	--	<0.0025	--	<0.0025	<0.0025	<0.0025	--	--	--
V3	2/8/94	5.5	44	--	1.6	--	2.800	0.72	3.9	--	--	--
V3	2/8/94	13	<1	--	<0.0025	--	<0.0025	<0.0025	<0.0025	--	--	--
V3	2/8/94	20.5	<1	--	<0.0025	--	<0.0025	<0.0025	<0.0025	--	--	--
V4	2/7/94	12.5	90	--	1.1	--	1.900	0.69	7.3	--	--	--
MW10	10/28/99	11.5	<1.0	<1.0	<0.005	--	<0.005	<0.005	<0.005	--	--	--
B-7	10/28/99	16.5	<1.0	<1.0	<0.005	--	<0.005	<0.005	<0.005	--	--	--
B-7	10/28/99	21.5	<1.0	<1.0	<0.005	--	<0.005	<0.005	<0.005	--	--	--
B-8	10/28/99	6.5	<1.0	13	<0.005	--	<0.005	<0.005	<0.005	--	--	--
B-8	10/28/99	11.5	<1.0	2.9	<0.005	--	<0.005	<0.005	<0.005	--	--	--
B-8	10/28/99	16.5	<1.0	<1.0	<0.005	--	<0.005	<0.005	<0.005	--	--	--
B-9	3/23/00	8	<1.0	<1.0	<0.005	--	<0.005	<0.005	<0.005	--	--	<0.05
MW11	8/29/01	5.5	<1.0	<1.0	<0.005	--	<0.005	<0.005	<0.005	--	--	<0.05
MW11	8/29/01	10.5	<1.0	<1.0	<0.005	--	<0.005	<0.005	<0.005	--	--	<0.05

APPENDIX D

**CUMULATIVE RESULTS OF GROUNDWATER
MONITORING AND SAMPLING DATA**

TABLE 1A
CUMULATIVE GROUNDWATER MONITORING AND SAMPLING DATA
 Redwood Oil Facility 114
 1855 Guerneville Road
 Santa Rosa, California
 (Page 1 of 14)

Well ID	Sample Date	TOC (fmsl)	DTW (fbgs)	GW Elev. (fmsl)	TPHd (µg/L)	TPH Diesel-range (µg/L)	TPHg (µg/L)	MTBE (µg/L)	B (µg/L)	T (µg/L)	E (µg/L)	X (µg/L)
MW1	09/01/89	108.21	15.20	93.01	--	--	--	--	--	--	--	--
MW1	06/01/90	108.21	9.61	98.60	--	--	--	--	--	--	--	--
MW1	02/01/91	123.18	13.48	109.70	210	--	2,200	--	370	99	88	180
MW1	03/01/91	123.18	12.10	111.08	--	--	--	--	--	--	--	--
MW1	04/01/91	123.18	6.07	117.11	--	--	--	--	--	--	--	--
MW1	05/16/91	123.18	10.24	112.94	60	--	2,900	--	370	38	80	120
MW1	06/07/91	123.18	12.36	110.82	--	--	--	--	--	--	--	--
MW1	07/01/91	123.18	12.76	110.42	--	--	--	--	--	--	--	--
MW1	08/01/91	123.18	15.17	108.01	--	--	--	--	--	--	--	--
MW1	08/16/91	123.18	16.01	107.17	60	--	1,800	--	590	16	77	69
MW1	09/09/91	123.18	16.34	106.84	--	--	--	--	--	--	--	--
MW1	10/04/91	123.18	16.47	106.71	--	--	--	--	--	--	--	--
MW1	11/06/91	123.18	15.20	107.98	--	--	--	--	--	23	51	66
MW1	12/06/91	123.18	14.00	109.18	530	--	1000	--	460	--	--	--
MW1	01/06/92	123.18	12.24	110.94	--	--	--	--	--	--	--	--
MW1	02/19/92	123.18	7.80	115.38	--	--	--	--	--	--	--	--
MW1	03/30/92	123.82	6.74	117.08	470	--	2600	--	600	0.5	100	130
MW1	04/23/92	123.82	7.76	116.06	--	--	--	--	--	--	--	--
MW1	05/18/92	123.82	9.69	114.13	--	--	--	6000	--	1100	110	150
MW1	06/16/92	123.82	11.91	111.91	<50	--	--	--	--	--	--	--
MW1	07/24/92	123.82	14.90	108.92	--	--	--	--	--	--	--	--
MW1	08/18/92	123.82	14.94	108.88	--	--	--	--	--	--	--	--
MW1	09/24/92	123.82	15.59	108.23	1600	--	16000	--	2400	52	310	320
MW1	10/21/92	123.82	15.59	108.23	--	--	--	--	--	--	--	--
MW1	11/16/92	123.82	15.41	108.41	--	--	--	--	--	--	--	--
MW1	12/16/92	123.82	9.78	114.04	100	--	70	--	4.5	0.5	0.7	1.2
MW1	01/13/93	123.82	6.34	117.48	--	--	--	--	--	--	--	--
MW1	02/23/93	123.82	7.48	116.34	--	--	--	--	--	--	--	--
MW1	03/17/93	123.82	8.68	115.14	710	--	<50	--	0.5	0.5	0.5	0.5
MW1	04/16/93	123.82	7.78	116.04	--	--	--	--	--	--	--	--
MW1	05/14/93	123.82	8.48	115.34	--	--	--	--	--	--	--	--
MW1	09/30/93	123.82	15.45	108.37	330	--	2300	--	930	21	38	50
MW1	03/22/94	123.25	7.52	115.73	540	--	5,900	--	610	24	55	44
MW1	09/22/94	123.25	13.70	109.55	70	--	5,800	--	1,500	86	210	340
MW1	03/24/95	123.25	3.76	119.49	370	--	1,500	--	260	30	58	85
MW1	08/30/95	123.25	11.81	111.44	390	--	12,000	--	2,800	210	410	580
MW1	03/19/96	123.25	5.52	117.73	<50	--	730	--	230	18	54	46
MW1	09/16/96	123.25	17.30	105.95	<50	--	470	--	74	20	18	32
MW1	03/24/97	123.25	14.27	108.98	70	--	170	--	21	8.7	6.7	11
MW1	09/29/97	123.25	18.00	105.25	60	--	550	--	74	21	28	44
MW1	04/30/98	123.25	7.55	115.70	<50	--	250	--	25	3.0	11	13
MW1	07/30/98	123.25	11.83	111.42	<50	--	4,000	24	510	170	180	240
MW1	10/27/98	123.25	23.97	99.28	<50	--	490	6	8	3	3	4

TABLE 1A
CUMULATIVE GROUNDWATER MONITORING AND SAMPLING DATA

Redwood Oil Facility 114
 1855 Guerneville Road
 Santa Rosa, California
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TABLE 1A
CUMULATIVE GROUNDWATER MONITORING AND SAMPLING DATA
 Redwood Oil Facility 114
 1855 Guerneville Road
 Santa Rosa, California
 (Page 3 of 14)

Well ID	Sample Date	TOC (fmsl)	DTW (fbgs)	GW Elev. (fmsl)	TPHd (µg/L)	TPH Diesel-range (µg/L)	TPHg (µg/L)	MTBE (µg/L)	B (µg/L)	T (µg/L)	E (µg/L)	X (µg/L)
MW2	02/19/92	122.68	6.05	116.63	---	---	---	---	---	---	---	---
MW2	03/30/92	123.14	6.55	116.59	---	---	---	---	---	---	---	---
MW2	04/23/92	123.14	6.24	116.90	---	---	---	---	---	---	---	---
MW2	05/18/92	123.14	7.09	116.05	---	---	---	---	---	---	---	---
MW2	06/16/92	123.14	7.65	115.49	---	---	---	---	---	---	---	---
MW2	07/24/92	123.14	9.51	113.63	---	---	---	---	---	---	---	---
MW2	08/18/92	123.14	9.50	113.64	---	---	---	---	---	---	---	---
MW2	09/24/92	123.14	8.97	114.17	---	---	---	---	---	---	---	---
MW2	10/21/92	123.14	8.73	114.41	---	---	---	---	---	---	---	---
MW2	11/16/92	123.14	8.64	114.50	---	---	---	---	---	---	---	---
MW2	12/16/92	123.14	7.07	116.07	---	---	---	---	---	---	---	---
MW2	01/13/93	123.14	5.78	117.36	---	---	---	---	---	---	---	---
MW2	02/23/93	123.14	10.19	112.95	---	---	---	---	---	---	---	---
MW2	03/17/93	123.14	8.41	114.73	---	---	---	---	---	---	---	---
MW2	04/16/93	123.14	6.75	116.39	---	---	---	---	---	---	---	---
MW2	05/14/93	123.14	8.47	114.67	---	---	---	---	---	---	---	---
MW2	09/30/93	123.14	13.61	109.53	---	---	25,000	---	370	670	640	3,400
MW2	03/22/94	123.14	6.34	116.80	25,000	---	51,000	---	730	1,700	1,700	8,300
MW2	09/22/94	123.20	8.40	114.80	30,000	---	---	---	---	---	---	---
MW2	03/27/95	123.20	5.92	117.28	---	---	---	---	---	---	---	---
MW2	08/30/95	123.20	7.96	115.24	---	---	19,000	---	120	79	540	1,600
MW2	03/19/96	123.20	6.14	117.06	13,000	---	---	---	---	---	---	---
MW2	09/16/96	123.20	7.15	116.05	---	53,000	---	650	1,000	3,000	13,000	---
MW2	03/24/97	123.20	5.00	118.20	32,000	---	---	---	---	---	---	---
MW2	09/29/97	123.20	7.16	116.04	---	64,000	---	390	0.5	1,600	5,700	---
MW2	04/30/98	123.20	4.83	118.37	1,600	---	340,000	5	640	290	3,000	8,200
MW2	07/30/98	123.20	5.87	117.33	77,000	---	110,000	6	240	50	1,400	3,000
MW2	10/27/98	123.20	7.32	115.88	1,200,009	---	31,000	<500	240	92	1,500	3,200
MW2	01/27/99	123.20	4.67	118.53	29,000	---	19,000	40	48	85	290	1,100
MW2	04/21/99	123.20	6.28	116.92	120,008	---	16,000	260	110	50	500	450
MW2	07/29/99	123.20	7.92	115.28	14,000	---	190,000	<50	960	770	5,100	1,300
MW2	10/28/99	123.20	20.30	102.90	120,008	---	9,300	60	13	42	130	440
MW2	02/04/00	123.20	7.89	115.31	8,100	---	19,000	240	1,400	900	710	2,000
MW2	04/27/00	123.20	13.25	109.95	5,700	---	11,000	3.21	52	20	55	120
MW2	07/25/00	123.20	8.77	114.43	1,700	---	10,000	57	380	200	310	650
MW2	10/26/00	123.20	15.42	107.78	2,000	---	4,100	19	190	39	170	310
MW2	01/17/01	123.20	8.75	114.45	4,900	---	3,400	84	130	42	170	270
MW2	04/24/01	123.20	16.24	106.96	5,000	---	3,900	<50	290	22	110	70
MW2	07/31/01	123.20	11.11	112.09	4,600	---	6,200	6.5	120	110	90	490
MW2	12/05/01	122.57	23.00	99.57	1,700	---	370	<5	4.2	2.1	3	18.8
MW2	01/31/02	122.57	23.00	99.57	1,100	---	910	74	35	16	9	62
MW2	04/17/02	122.57	18.10	104.47	1,100	---	920	45	22	4	1	26
MW2	07/10/02	122.57	18.25	104.32	2,100	---	---	---	---	---	---	---

TABLE 1A
CUMULATIVE GROUNDWATER MONITORING AND SAMPLING DATA
 Redwood Oil Facility 114
 1855 Guerneville Road
 Santa Rosa, California
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Well ID	Sample Date	TOC (fmsl)	DTW (fbgs)	GW Elev. (fmsl)	TPHd ($\mu\text{g/L}$)	TPH Diesel-range ($\mu\text{g/L}$)	TPHg ($\mu\text{g/L}$)	MTBE ($\mu\text{g/L}$)	B ($\mu\text{g/L}$)	T ($\mu\text{g/L}$)	E ($\mu\text{g/L}$)	X ($\mu\text{g/L}$)
MW2	10/10/02	122.57	18.16	104.41	2,100	---	120,024	52	1.1	4.7	0.5	2.2
MW2	01/13/03	122.57	5.18	117.39	4,200	---	1,600	<2	16	<5	18	12
MW2	03/14/03	122.57	17.85	104.72	---	---	---	---	---	---	---	---
MW2	04/16/03	122.57	14.50	108.07	520	---	<50	14	4	<1	<1	1
MW2	07/16/03	122.57	18.50	104.07	2,300	---	1,100	67	66	4	26	13
MW2	10/21/03	122.57	14.69	107.88	5,800	---	2,700	100	190	9	140	29
MW2	04/06/04	122.57	14.69	107.88	<210	---	420	8.7	2.7	1.2	0.9	6
MW2	12/31/04	122.57	3.84	118.73	1,000	---	1,100	<1	24	1.5	22	8
MW2	04/22/05	122.57	4.27	118.30	2,200a	---	4,900	<5	21	7.7	14	52
MW2	08/24/05	122.57	6.74	115.83	4,300b	---	5,100c	<5.0	7.1	<2.5	3.0	<2.5
MW2	03/08/06	122.57	3.21	119.36	<300	---	1,200	<0.50	12	0.80	13	1.4
MW3	09/01/89	106.88	14.14	92.74	---	---	---	---	---	---	---	---
MW3	10/06/89	106.88	---	---	---	---	85,700	---	720	2,640	720	7,860
MW3	06/01/90	106.88	8.44	98.44	---	---	---	---	---	---	---	---
MW3	11/15/90	106.88	---	---	1,300	---	16,000	---	1,000	420	<50	2,000
MW3	02/01/91	122.73	11.35	111.38	1,500	---	22,000	---	2,400	1,300	940	3,100
MW3	03/01/91	122.73	9.83	112.90	---	---	---	---	---	---	---	---
MW3	04/01/91	122.73	5.84	116.89	---	---	---	---	---	---	---	---
MW3	05/16/91	122.73	9.48	113.25	1,400	---	21,000	---	1,800	1,000	710	2,300
MW3	06/07/91	122.73	10.95	111.78	---	---	---	---	---	---	---	---
MW3	07/01/91	122.73	7.20	115.53	---	---	---	---	---	---	---	---
MW3	08/01/91	122.73	12.85	109.88	---	---	---	---	---	---	---	---
MW3	08/16/91	122.73	14.15	108.58	960	---	16,000	---	1,400	730	120	1,200
MW3	09/09/91	122.73	14.42	108.31	---	---	---	---	---	---	---	---
MW3	10/04/91	122.73	14.57	108.16	---	---	---	---	---	---	---	---
MW3	11/06/91	122.73	13.28	109.45	---	---	---	---	---	---	---	---
MW3	12/06/91	122.73	12.34	110.39	3,600	---	19,000	---	2,300	1,000	690	1,900
MW3	01/06/92	122.73	10.42	112.31	---	---	---	---	---	---	---	---
MW3	02/19/92	122.73	5.79	116.94	---	---	---	---	580	590	320	2,000
MW3	03/30/92	122.73	6.07	116.66	3,900	---	12,000	---	---	---	---	---
MW3	04/23/92	122.73	7.46	115.27	---	---	---	---	---	---	---	---
MW3	05/18/92	122.73	9.13	113.60	---	---	---	---	---	---	---	---
MW3	06/16/92	122.73	10.51	112.22	21,000	---	17,000	---	2,100	1,300	620	2,000
MW3	07/24/92	122.73	12.92	109.81	---	---	---	---	---	---	---	---
MW3	08/18/92	122.73	13.04	109.69	---	---	---	---	---	---	---	---
MW3	09/24/92	122.73	13.96	108.77	5,800	---	72,000	---	1,500	350	600	1,600
MW3	10/21/92	122.73	13.40	109.33	---	---	---	---	---	---	---	---
MW3	11/16/92	122.73	13.88	108.85	---	---	---	---	---	---	---	---
MW3	12/16/92	122.73	8.40	114.33	140	---	250	---	0.5	0.5	0.5	2
MW3	01/13/93	122.73	5.73	117.00	---	---	---	---	---	---	---	---
MW3	02/23/93	122.73	9.39	113.34	---	---	---	---	380	130	48	130
MW3	03/17/93	122.73	8.82	113.91	790	---	2,300	---	---	---	---	---

TABLE 1A
CUMULATIVE GROUNDWATER MONITORING AND SAMPLING DATA
 Redwood Oil Facility 114
 1855 Guerneville Road
 Santa Rosa, California
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Well ID	Sample Date	TOC (fmsl)	DTW (fbgs)	GW Elev. (fmsl)	TPHd (µg/L)	TPH Diesel-range (µg/L)	TPHg (µg/L)	MTBE (µg/L)	B (µg/L)	T (µg/L)	E (µg/L)	X (µg/L)
MW3	04/16/93	122.73	7.64	115.09	---	---	---	---	---	---	---	---
MW3	05/14/93	122.73	7.57	115.16	---	---	---	---	---	---	---	---
MW3	09/30/93	122.73	14.10	108.63	2,300	---	14,000	---	1,900	450	500	1,000
MW3	03/22/94	122.72	5.80	116.92	1,100	---	200	---	7.4	7.9	5	20
MW3	09/22/94	122.72	---	---	---	---	---	---	---	---	---	---
MW3	03/27/95	122.72	---	---	---	---	---	---	---	---	---	---
MW3	08/30/95	122.72	---	---	---	---	---	---	---	---	---	---
MW3	03/19/96	122.72	8.91	113.81	<50	---	920	---	41	24	25	66
MW3	09/16/96	122.72	17.26	105.46	<100	---	9,500	---	710	500	380	1,200
MW3	03/24/97	122.72	13.85	108.87	410	---	1,300	---	17	4.1	6.4	42
MW3	09/29/97	122.72	13.63	109.09	<50	---	1,900	---	140	44	69	160
MW3	04/30/98	122.72	5.22	117.50	<50	---	<50	---	0.5	0.5	0.5	0.82
MW3	07/30/98	122.72	9.29	113.43	2,100	---	16,000	32	320	450	540	1,600
MW3	10/27/98	122.72	19.27	103.45	500	---	1,000	7	6	0.5	2	3
MW3	01/27/99	122.72	8.72	114.00	<50	---	<50	5	0.5	0.5	0.5	0.5
MW3	04/21/99	122.72	10.97	111.75	<50	---	72	18	2.1	1.4	2.6	10
MW3	07/29/99	122.72	12.03	110.69	2608	---	920	19	50	30	38	110
MW3	10/28/99	122.72	11.04	111.68	4908	---	2,200	5	65	36	80	210
MW3	02/04/00	122.72	5.12	117.60	<50	---	<50	0.5	0.5	0.5	0.5	0.5
MW3	04/27/00	122.72	4.90	117.82	<50	---	220	8.1	0.96	0.72	1.6	2.4
MW3	07/25/00	122.72	9.62	113.10	110	---	160	6.7	16	2.7	4.2	2.9
MW3	10/26/00	122.72	10.61	112.11	<50	---	2,100	12	86	6.3	31	9.8
MW3	01/17/01	122.72	9.64	113.08	340	---	440	7.1	46	3.6	14	6.1
MW3	04/24/01	122.72	5.46	117.26	61	---	93	5	0.66	0.5	0.5	0.5
MW3	07/31/01	122.72	10.31	112.41	150	---	460	15	12	1.9	5.9	4.5
MW3	12/05/01	123.26	23.00	100.26	120	---	80	<5	0.89	0.52	0.5	4.4
MW3	01/31/02	123.26	23.00	100.26	<50	---	230	<5	7.3	2.6	10	22.6
MW3	04/17/02	123.26	21.10	102.16	260	---	1,500	11	31	11	11	132
MW3	07/10/02	123.26	11.45	111.81	160	---	1,400	32	53	100	49	245
MW3	10/10/02	123.26	---	---	---	---	---	---	---	---	---	---
MW3	01/13/03	123.26	3.05	120.21	---	---	---	---	---	---	---	---
MW3	03/14/03	123.26	11.80	111.46	57	---	<50	<1	0.5	0.5	0.5	<1
MW3	04/16/03	123.26	11.30	111.96	<50	---	63	2	2	<1	1	4
MW3	07/16/03	123.26	11.15	112.11	190	---	120	10	5	<1	4	5
MW3	10/21/03	123.26	12.00	111.26	760	---	370	6	47	3	28	21
MW3	04/06/04	123.26	12.00	111.26	<50	---	120	0.5	1.3	0.7	2.4	6
MW3	12/31/04	123.26	4.91	118.35	<50	---	<50	<1	<0.5	<0.5	<0.5	<0.5
MW3	04/22/05	123.26	3.36	119.90	<50	---	46	<1	<0.5	<0.5	<0.5	<0.5
MW3	08/24/05	123.26	9.01	114.25	<50	370	940c	<1.0	1.6	0.74	2.2	3.2
MW3	03/08/06	123.26	4.35	118.91	<50	---	<50	<0.50	<0.50	<0.50	<0.50	<0.50
MW4	03/22/94	122.64	6.45	116.19	1,500	---	5,900	---	150	110	130	420
MW4	09/22/94	122.64	11.54	111.10	70	---	4,600	---	360	130	220	370

TABLE 1A
CUMULATIVE GROUNDWATER MONITORING AND SAMPLING DATA

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TABLE 1A
CUMULATIVE GROUNDWATER MONITORING AND SAMPLING DATA
 Redwood Oil Facility 114
 1855 Guerneville Road
 Santa Rosa, California
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Well ID	Sample Date	TOC (fmsl)	DTW (fbgs)	GW Elev. (fmsl)	TPHd ($\mu\text{g/L}$)	TPH Diesel-range ($\mu\text{g/L}$)	TPHg ($\mu\text{g/L}$)	MTBE ($\mu\text{g/L}$)	B ($\mu\text{g/L}$)	T ($\mu\text{g/L}$)	E ($\mu\text{g/L}$)	X ($\mu\text{g/L}$)
MW5	10/21/92	122.14	---	---	---	---	---	---	---	---	---	---
MW5	11/16/92	122.14	---	---	---	---	---	---	0.5	0.5	0.5	0.5
MW5	12/16/92	122.14	10.19	111.95	<50	---	<50	---	---	---	---	---
MW5	01/13/93	122.14	4.74	117.40	---	---	---	---	---	---	---	---
MW5	02/23/93	122.14	10.93	111.21	---	---	---	---	0.5	0.5	0.5	0.5
MW5	03/17/93	122.14	6.85	115.29	690	---	<50	---	---	---	---	---
MW5	04/16/93	122.14	10.61	111.53	---	---	---	---	---	---	---	---
MW5	05/14/93	122.14	7.73	114.41	---	---	---	---	---	---	---	---
MW5	09/30/93	122.14	---	---	---	---	---	---	2.7	0.5	1	6.5
MW5	03/22/94	122.14	10.87	111.27	660	---	90	---	---	---	---	---
MW5	09/22/94	122.14	11.98	110.16	---	---	140	---	20	27	7.3	45
MW5	03/27/95	122.14	4.75	117.39	110	---	<50	---	0.5	0.5	0.5	0.5
MW5	08/30/95	122.14	9.86	112.28	50	---	290	---	22	24	10	44
MW5	03/19/96	122.14	10.21	111.93	<50	---	---	---	---	---	---	---
MW5	09/16/96	122.14	---	---	---	---	---	---	---	---	---	---
MW5	03/24/97	122.14	---	---	---	---	---	---	---	---	---	---
MW5	09/29/97	122.14	---	---	---	---	---	---	---	---	---	---
MW5	04/30/98	122.14	---	---	---	---	---	---	---	---	---	---
MW5	07/30/98	122.14	---	---	---	---	---	---	---	---	---	---
MW5	10/27/98	122.14	---	---	---	---	---	---	---	---	---	---
MW5	01/27/99	122.14	---	---	---	---	---	---	---	---	---	---
MW5	04/21/99	122.14	---	---	---	---	---	---	---	---	---	---
MW5	Well destroyed.											
MW6	03/30/92	122.86	7.38	115.48	14,000	---	69,000	---	11,000	19,000	1,400	16,000
MW6	04/23/92	122.86	7.63	115.23	---	---	---	---	---	---	---	---
MW6	05/18/92	122.86	8.62	114.24	---	---	---	---	---	---	---	---
MW6	06/16/92	122.86	9.97	112.89	<50	---	73,000	---	5,900	1,400	2,400	6,700
MW6	07/24/92	122.86	11.72	111.14	---	---	---	---	---	---	---	---
MW6	08/18/92	122.86	11.93	110.93	---	---	---	---	---	---	---	---
MW6	09/24/92	122.86	---	---	---	---	---	---	---	---	---	---
MW6	10/21/92	122.86	---	---	---	---	---	---	---	---	---	---
MW6	11/16/92	122.86	---	---	---	---	---	---	---	---	---	---
MW6	12/16/92	122.86	10.9	111.96	17,000	---	61,000	---	6,700	8,700	770	9,100
MW6	01/13/93	122.86	6.67	116.19	---	---	---	---	---	---	---	---
MW6	02/23/93	122.86	10.65	112.21	---	---	---	---	---	---	---	---
MW6	03/17/93	122.86	8.68	114.18	1,800	---	2,800	---	360	140	17	580
MW6	04/16/93	122.86	7.45	115.41	---	---	---	---	---	---	---	---
MW6	05/14/93	122.86	7.48	115.38	---	---	---	---	---	---	---	---
MW6	09/30/93	122.86	---	---	---	---	---	---	---	---	---	---
MW6	03/22/94	122.86	7.03	115.83	22,000	---	5,000	---	620	92	290	660
MW6	09/22/94	122.86	12.24	110.62	---	---	---	---	---	---	---	---
MW6	03/27/95	122.86	8.61	114.25	6,300	---	18,000	---	3,900	2,000	1,000	3,200

TABLE 1A
CUMULATIVE GROUNDWATER MONITORING AND SAMPLING DATA
 Redwood Oil Facility 114
 1855 Guerneville Road
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Well ID	Sample Date	TOC (fmsl)	DTW (fbgs)	GW Elev. (fmsl)	TPHd ($\mu\text{g/L}$)	TPH Diesel-range ($\mu\text{g/L}$)	TPHg ($\mu\text{g/L}$)	MTBE ($\mu\text{g/L}$)	B ($\mu\text{g/L}$)	T ($\mu\text{g/L}$)	E ($\mu\text{g/L}$)	X ($\mu\text{g/L}$)
MW6	08/30/95	122.86	10.3	112.56	---	---	28,000	---	3,200	290	1,500	2,500
MW6	03/19/96	122.86	8.21	114.65	<100	---	20,000	---	3,600	780	1,300	2,500
MW6	09/16/96	122.86	---	---	---	---	---	---	---	---	---	---
MW6	03/24/97	122.86	---	---	---	---	---	---	---	---	---	---
MW6	09/29/97	122.86	---	---	---	---	---	---	---	---	---	---
MW6	04/30/98	122.86	---	---	---	---	---	---	---	---	---	---
MW6	07/30/98	122.86	---	---	---	---	---	---	---	---	---	---
MW6	10/27/98	122.86	---	---	---	---	---	---	---	---	---	---
MW6	01/27/99	122.86	---	---	---	---	---	---	---	---	---	---
MW6	04/21/99	122.86	8.38	114.48	1908	---	3,600	5	300	41	150	150
MW6	07/29/99	122.86	---	---	---	---	---	---	---	---	---	---
MW6	04/27/00	122.86	7.51	115.35	<50	---	1,400	18	71	15	21	13
MW6	Well destroyed.											
MW7	03/30/92	123.53	5.53	118.00	5,040	---	86,000	---	20,000	22,000	3,200	14,000
MW7	04/23/92	123.53	6.57	116.96	---	---	---	---	---	---	---	---
MW7	05/18/92	123.53	7.66	115.87	---	---	---	---	---	---	---	---
MW7	06/16/92	123.53	---	---	<50	---	310,000	---	24,000	30,000	7,000	30,000
MW7	06/22/92	123.53	---	---	---	---	---	---	---	---	---	---
MW7	07/24/92	123.53	12.03	111.50	---	---	---	---	---	---	---	---
MW7	08/18/92	123.53	12.14	111.39	---	---	---	---	---	---	---	---
MW7	09/24/92	123.53	12.83	110.70	32,000	---	110,000	---	23,000	27,000	3,300	16,000
MW7	10/21/92	123.53	12.63	110.90	---	---	---	---	---	---	---	---
MW7	11/16/92	123.53	12.71	110.82	---	---	---	---	---	---	---	---
MW7	12/16/92	123.53	7.75	115.78	11,000	---	67,000	---	12,000	15,000	1,100	7,800
MW7	01/13/93	123.53	5.40	118.13	---	---	---	---	---	---	---	---
MW7	02/23/93	123.53	10.81	112.72	---	---	---	---	---	---	---	---
MW7	03/17/93	123.53	7.67	115.86	12,000	---	48,000	---	10,000	14,000	1,400	7,800
MW7	04/16/93	123.53	6.35	117.18	---	---	---	---	---	---	---	---
MW7	05/14/93	123.53	8.38	115.15	---	---	---	---	---	---	---	---
MW7	09/30/93	123.53	13.45	110.08	14,000	---	74,000	---	7,600	11,000	1,400	7,700
MW7	03/22/94	123.50	6.20	117.30	27,000	---	63,000	---	7,600	12,000	1,100	8,300
MW7	09/22/94	123.50	13.70	109.80	1,100	---	76,000	---	11,000	13,000	1,500	8,900
MW7	03/27/95	123.50	3.87	119.63	---	---	---	---	---	---	---	---
MW7	08/30/95	123.50	9.14	114.36	5,400	---	100,000	---	16,000	4,800	2,600	13,000
MW7	03/19/96	123.50	6.19	117.31	<250	---	64,000	---	9,000	9,800	1,600	8,300
MW7	09/16/96	123.50	13.83	109.67	<500	---	50,000	---	5,500	6,800	1,600	7,100
MW7	03/24/97	123.50	13.50	110.00	4,600	---	68,000	---	5,800	9,600	2,700	11,000
MW7	09/29/97	123.50	13.42	110.08	3,600	---	21,000	---	1,700	1,900	910	3,800
MW7	04/30/98	123.50	7.60	115.90	290	---	16,000	---	1,300	1,300	630	2,300
MW7	07/30/98	123.50	13.07	110.43	660	---	18,000	20	310	560	530	2,000
MW7	10/27/98	123.50	13.98	109.52	4	---	11,000	54	780	460	310	1,500
MW7	01/27/99	123.50	13.58	109.92	<50	---	32,000	360	1,500	1,900	1,100	3,700

TABLE 1A
CUMULATIVE GROUNDWATER MONITORING AND SAMPLING DATA
 Redwood Oil Facility 114
 1855 Guerneville Road
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Well ID	Sample Date	TOC (fmsl)	DTW (fbgs)	GW Elev. (fmsl)	TPHd ($\mu\text{g/L}$)	TPH Diesel-range ($\mu\text{g/L}$)	TPHg ($\mu\text{g/L}$)	MTBE ($\mu\text{g/L}$)	B ($\mu\text{g/L}$)	T ($\mu\text{g/L}$)	E ($\mu\text{g/L}$)	X ($\mu\text{g/L}$)
MW7	04/21/99	123.50	5.65	117.85	510	---	15,000	130	800	510	410	1,400
MW7	07/29/99	123.50	10.85	112.65	1,900	---	7,000	150	330	120	330	810
MW7	10/28/99	123.50	13.68	109.82	1,300	---	11,000	5	300	32	630	1,500
MW7	02/04/00	123.50	13.56	109.94	<50	---	26,000	980	980	1,300	710	2,800
MW7	04/27/00	123.50	9.56	113.94	490	---	3,000	1,100	110	32	170	290
MW7	07/25/00	123.50	---	---	---	---	---	---	---	---	---	---
MW7	10/26/00	123.50	10.60	112.90	<50	---	1,100	0.5	34	19	21	74
MW7	01/17/01	123.50	10.14	113.36	1,100	---	600	5	5.1	2.2	12	17
MW7	04/24/01	123.50	13.26	110.24	5,300	---	10,000	<250	580	990	610	2,100
MW7	07/31/01	123.50	11.77	111.73	390	---	750	16	16	8.6	24	38
MW7	12/05/01	124.46	27.00	97.46	150	---	610	33	81	46	18	82
MW7	01/31/02	124.46	27.00	97.46	260	---	1,400	22	72	43	5.5	191
MW7	04/17/02	124.46	25.80	98.66	460	---	1,500	29	37	67	12	320
MW7	07/10/02	124.46	25.85	98.61	340	---	1,700	36	55	130	60	292
MW7	10/10/02	124.46	25.80	98.66	380	---	670	21	4.8	6.4	1.1	20
MW7	01/13/03	124.46	7.91	116.55	1,900	---	9,800	14	360	230	470	1,500
MW7	03/14/03	124.46	25.80	98.66	---	---	---	---	---	---	---	---
MW7	04/16/03	124.46	25.80	98.66	<50	---	<50	14	<1	<1	<1	<1
MW7	07/16/03	124.46	25.80	98.66	110	---	<50	15	1	<1	<1	<1
MW7	10/21/03	124.46	25.80	98.66	<50	---	<50	2	<1	<1	<1	<1
MW7	04/06/04	124.46	25.80	98.66	1,700	---	3,700	7.2	150	82	200	437
MW7	12/31/04	124.46	8.17	116.29	<50	---	3,200	<2	150	66	120	210
MW7	04/22/05	124.46	7.36	117.10	<50	---	8,700	14	170	110	360	340
MW7	08/24/05	124.46	12.38	112.08	<50	440	2,300c	<30	98	<20	92	23
MW7	03/08/06	124.46	5.07	119.39	<400	---	4,300	5.9	130	49	240	150
MW8	03/30/92	124.10	6.00	118.10	9,090	---	22,000	---	860	3,200	580	4,000
MW8	04/23/92	124.10	6.89	117.21	---	---	---	---	---	---	---	---
MW8	05/18/92	124.10	9.00	115.10	---	---	---	---	---	---	---	---
MW8	06/16/92	124.10	11.71	112.39	<50	---	83,000	---	10,000	16,000	1,900	8,500
MW8	07/24/92	124.10	14.51	109.59	---	---	---	---	---	---	---	---
MW8	08/18/92	124.10	14.65	109.45	---	---	---	---	---	---	---	---
MW8	09/24/92	124.10	15.58	108.52	---	---	---	---	---	---	---	---
MW8	10/21/92	124.10	15.43	108.67	---	---	---	---	---	---	---	---
MW8	11/16/92	124.10	5.46	118.64	---	---	---	---	---	---	---	---
MW8	12/16/92	124.10	7.73	116.37	---	---	---	---	---	---	---	---
MW8	01/13/93	124.10	5.30	118.80	---	---	---	---	---	---	---	---
MW8	02/23/93	124.10	10.31	113.79	---	---	---	---	---	---	---	---
MW8	03/17/93	124.10	7.67	116.43	---	---	---	---	---	---	---	---
MW8	04/16/93	124.10	6.56	117.54	---	---	---	---	---	---	---	---
MW8	05/14/93	124.10	8.13	115.97	---	---	---	---	---	---	---	---
MW8	09/30/93	124.10	15.10	109.00	35,000	---	110,000	---	12,000	34,000	4,000	22,000
MW8	03/22/94	123.95	5.10	118.85	460,000	---	69,000	---	1,400	12,000	2,800	15,000

TABLE 1A
CUMULATIVE GROUNDWATER MONITORING AND SAMPLING DATA
 Redwood Oil Facility 114
 1855 Guerneville Road
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Well ID	Sample Date	TOC (fmsl)	DTW (fbgs)	GW Elev. (fmsl)	TPHd ($\mu\text{g/L}$)	TPH Diesel-range ($\mu\text{g/L}$)	TPHg ($\mu\text{g/L}$)	MTBE ($\mu\text{g/L}$)	B ($\mu\text{g/L}$)	T ($\mu\text{g/L}$)	E ($\mu\text{g/L}$)	X ($\mu\text{g/L}$)
MW8	09/22/94	123.95	13.86	110.09	4,600	---	66,000	---	2,300	8,400	1,900	10,000
MW8	03/27/95	123.95	3.25	120.70	---	---	---	---	---	---	---	---
MW8	08/30/95	123.95	11.05	112.90	---	---	---	---	---	---	---	---
MW8	03/19/96	123.95	4.08	119.87	<50	---	5,800	---	5.3	130	91	480
MW8	09/16/96	123.95	14.49	109.46	<500	---	18,000	---	110	810	320	2,900
MW8	03/24/97	123.95	5.58	118.37	8,600	---	20,000	---	40	45	67	170
MW8	09/29/97	123.95	13.29	110.66	640	---	1,200	---	19	1.1	2.2	5.6
MW8	04/30/98	123.95	5.55	118.40	<50	---	260	---	0.87	0.5	1.1	1.9
MW8	07/30/98	123.95	10.42	113.53	250	---	6,100	5	33	150	100	410
MW8	10/27/98	123.95	15.41	108.54	59	---	6,900	2	9	20	42	240
MW8	01/27/99	123.95	5.42	118.53	<50	---	600	5	0.5	1.4	1.3	8.9
MW8	04/21/99	123.95	7.70	116.25	100	---	2,100	7.7	4.3	0.76	4.1	37
MW8	07/29/99	123.95	11.01	112.94	1,300	---	9,800	88	24	60	130	630
MW8	10/28/99	123.95	16.98	106.97	---	---	24,000	<50	<50	310	330	1,500
MW8	02/04/00	123.95	10.78	113.17	160,000	---	2,200,000	<500	<500	7,200	9,600	82,000
MW8	03/09/00	123.95	---	---	3,300	---	9,600	90	27	200	140	690
MW8	03/09/00	123.95	---	---	3,100	---	12,000	260	<50	260	150	800
MW8	04/27/00	123.95	14.82	109.13	12,000	---	47,000	240	130	760	590	2,100
MW8	07/25/00	123.95	12.50	111.45	2,200	---	16,000	<10	55	29	68	210
MW8	10/26/00	123.95	—	—	530,000	---	110,000	<550	<550	<550	900	3,400
MW8	01/17/01	123.95	15.57	108.38	83,000	---	1,400	<50	52	55	24	150
MW8	04/24/01	123.95	8.10	115.85	55,000	---	43,000	<500	<50	300	450	3,100
MW8	07/31/01	123.95	14.31	109.64	7,000	---	11,000	<250	93	100	69	210
MW8	12/05/01	124.07	27.00	97.07	81	---	380	<5	3	5.1	2.1	28
MW8	01/31/02	124.07	27.00	97.07	<50	---	<50	<5	0.5	0.5	0.5	0.5
MW8	04/17/02	124.07	20.05	104.02	1,000	---	3,100	<1	30	5	1	207
MW8	07/10/02	124.07	25.82	98.25	1,100	---	3,200	2	340	52	13	450
MW8	10/10/02	124.07	25.80	98.27	2,000	---	11,000	<25	550	220	130	370
MW8	01/13/03	124.07	3.60	120.47	880	---	150	<1	0.5	0.5	0.5	4.6
MW8	03/14/03	124.07	25.80	98.27	---	---	---	---	---	---	---	---
MW8	04/16/03	124.07	7.61	116.46	7,400	---	1,300	<1	41	22	6	86
MW8	07/16/03	124.07	25.80	98.27	32,000	---	750	3	26	24	8	91
MW8	10/21/03	124.07	25.80	98.27	1,600	---	4,600	<1	8	59	8	470
MW8	04/06/04	124.07	25.80	98.27	<50	---	61	0.5	0.5	0.5	0.5	1.4
MW8	12/31/04	124.07	3.70	120.37	<50	---	<50	<1	<0.5	<0.5	<0.5	<0.5
MW8	04/22/05	124.07	4.11	119.96	<50	---	<25	<1	<0.5	<0.5	<0.5	<0.5
MW8	08/24/05	124.07	7.92	116.15	<50	---	1,100c	<1.0	<0.50	<0.50	<0.50	1.2
MW8	03/08/06	124.07	2.79	121.28	<50	---	<50	<0.50	<0.50	<0.50	<0.50	<0.50
MW9	03/22/94	122.57	5.74	116.83	150,000	---	47,000	---	810	2,800	900	11,000
MW9	09/22/94	122.57	8.40	114.17	4,100	---	52,000	---	900	1,300	1,600	7,700
MW9	03/27/95	122.57	5.15	117.42	---	---	---	---	---	---	---	---
MW9	08/30/95	122.57	7.20	115.37	5,500	---	19,000	---	380	220	520	2,100

TABLE 1A
CUMULATIVE GROUNDWATER MONITORING AND SAMPLING DATA
 Redwood Oil Facility 114
 1855 Guerneville Road
 Santa Rosa, California
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Well ID	Sample Date	TOC (fmsl)	DTW (fbgs)	GW Elev. (fmsl)	TPHd ($\mu\text{g/L}$)	TPH Diesel-range ($\mu\text{g/L}$)	TPHg ($\mu\text{g/L}$)	MTBE ($\mu\text{g/L}$)	B ($\mu\text{g/L}$)	T ($\mu\text{g/L}$)	E ($\mu\text{g/L}$)	X ($\mu\text{g/L}$)	
MW9	03/19/96	122.57	5.43	117.14	5,000	---	9,000	---	150	140	170	670	
MW9	09/16/96	122.57	12.98	109.59	2,000	---	6,500	---	560	720	220	1,100	
MW9	03/24/97	122.57	6.42	116.15	290	---	250	---	7.6	1.3	2.5	12	
MW9	09/29/97	122.57	12.53	110.04	1,200	---	2,700	---	170	60	1.5	520	
MW9	04/30/98	122.57	5.17	117.40	<50	---	350	---	11	0.5	7.7	22	
MW9	07/30/98	122.57	7.01	115.56	360	---	<500	5	21	<5	<5	6.8	
MW9	10/27/98	122.57	8.80	113.77	<50	---	330	2	0.5	0.5	0.5	<1	
MW9	01/27/99	122.57	6.06	116.51	<50	---	100	7.7	8.9	0.5	1.1	0.5	
MW9	04/21/99	122.57	5.97	116.60	<50	---	<50	6.6	3.2	0.5	0.5	1.1	
MW9	07/29/99	122.57	6.24	116.33	538	---	120	5	0.9	0.8	0.8	1.6	
MW9	10/28/99	122.57	11.50	111.07	<50	---	78	0.5	0.5	1	0.5	1.7	
MW9	02/04/00	122.57	6.10	116.47	<50	---	200	0.5	8.5	2.8	0.5	3.2	
MW9	04/27/00	122.57	5.12	117.45	<50	---	110	11	3.6	1.2	0.5	0.5	
MW9	07/25/00	122.57	6.67	115.90	180	---	900	3.1	15	1.9	13	19	
MW9	10/26/00	122.57	6.56	116.01	<50	---	510	0.5	8.2	0.8	1.5	0.6	
MW9	01/17/01	122.57	9.11	113.46	2,100	---	290	5	5.4	3.8	1.6	8.8	
MW9	04/24/01	122.57	6.31	116.26	200	---	160	5	9.6	0.78	2.2	1.6	
MW9	07/31/01	122.57	10.95	111.62	100	---	160	5	1.9	0.9	0.5	3.3	
MW9	12/05/01	123.60	5.21	118.39	570	---	570	<5	72	6.5	9.2	17	
MW9	01/31/02	123.60	8.50	115.10	520	---	820	<5	<5	<5	<5	<5	
MW9	04/17/02	123.60	12.51	111.09	54	---	290	1	46	67	6	25	
MW9	07/10/02	123.60	13.55	110.05	350	---	220	<1	6	5	2	6	
MW9	10/10/02	123.60	14.11	109.49	1,200	---	3,100	<10	<25	<25	98	280	
MW9	01/13/03	123.60	4.32	119.28	470	---	580	<2	27	5.3	3.2	9.2	
MW9	03/14/03	123.60	8.05	115.55	---	---	87	<1	7	<1	<1	1	
MW9	04/16/03	123.60	7.21	116.39	93	---	430	7	<1	<1	<1	4	
MW9	07/16/03	123.60	9.07	114.53	450	---	140	2	<1	<1	<1	1	
MW9	10/21/03	123.60	12.88	110.72	76	---	99	1.1	5.4	4.9	1.2	15.6	
MW9	04/06/04	123.60	6.82	116.78	51	---	14,000	<10	320	560	420	1,500	
MW9	12/31/04	123.60	4.88	118.72	<50	---	16,000	<20	190	600	470	1,700	
MW9	04/22/05	123.60	5.54	118.06	3,900a	---	940	6,500c	<20	29	89	85	270
MW9	08/24/05	123.60	7.97	115.63	<50	---	3,300	<0.50	13	26	110	170	
MW9	03/08/06	123.60	4.56	119.04	<600	---	---	---	---	---	---	---	
MW10	11/11/99	122.52	15.03	107.49	<50	---	<50	5	0.5	0.5	0.5	0.5	
MW10	02/04/00	122.52	11.30	111.22	<50	---	<50	0.5	0.5	0.5	0.5	0.5	
MW10	04/27/00	122.52	11.98	110.54	<50	---	<50	7.4	0.5	0.5	0.5	0.5	
MW10	07/25/00	122.52	14.60	107.92	120	---	<50	2	0.5	0.5	0.5	0.5	
MW10	10/26/00	122.52	15.83	106.69	<50	---	<50	0.5	0.5	0.5	0.5	0.5	
MW10	01/17/01	122.52	13.00	109.52	<50	---	<50	5	0.5	0.5	0.5	0.5	
MW10	04/24/01	122.52	---	---	---	---	---	---	---	---	---	---	
MW10	08/06/01	122.52	16.21	106.31	<50	---	<50	5	0.5	0.5	0.5	0.5	
MW10	12/05/01	123.85	9.40	114.45	150	---	<50	<5	0.5	0.5	0.5	0.5	

TABLE 1A
CUMULATIVE GROUNDWATER MONITORING AND SAMPLING DATA

Redwood Oil Facility 114
1855 Guerneville Road
Santa Rosa, California
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TABLE 1A
CUMULATIVE GROUNDWATER MONITORING AND SAMPLING DATA

Redwood Oil Facility 114
1855 Guerneville Road
Santa Rosa, California
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TABLE 1A
CUMULATIVE GROUNDWATER MONITORING AND SAMPLING DATA
 Redwood Oil Facility 114
 1855 Guerneville Road
 Santa Rosa, California
 (Page 14 of 14)

Well ID	Sample Date	TOC (fmsl)	DTW (fbgs)	GW Elev. (fmsl)	TPHd ($\mu\text{g}/\text{L}$)	TPH Diesel-range ($\mu\text{g}/\text{L}$)	TPHg ($\mu\text{g}/\text{L}$)	MTBE ($\mu\text{g}/\text{L}$)	B ($\mu\text{g}/\text{L}$)	T ($\mu\text{g}/\text{L}$)	E ($\mu\text{g}/\text{L}$)	X ($\mu\text{g}/\text{L}$)
V4	04/16/03	124.81	7.14	117.67	---	---	---	---	---	---	---	---
V4	07/16/03	124.81	8.11	116.70	---	---	---	---	---	---	---	---
V4	10/21/03	124.81	10.11	114.70	---	---	---	---	---	---	---	---
V4	04/06/04	124.81	7.16	117.65	---	---	---	---	---	---	---	---
V4	12/31/04	124.81	6.26	118.55	---	---	---	---	---	---	---	---
V4	04/22/05	124.81	6.66	118.15	---	---	---	---	---	---	---	---
V4	08/24/05	124.81	7.86	116.95	---	---	---	---	---	---	---	---
V4	03/08/06	124.81	5.98	118.83	---	---	---	---	---	---	---	---
			2.79									
			27.00									

Notes:

Data collected prior to April, 2004 compiled from the ECM Group Systems Operations Report dated July 9, 2004.

TOC	=	Top of well casing elevation; datum is mean sea level.
DTW	=	Depth to water.
GW Elev.	=	Groundwater elevation; datum is mean sea level.
TPHd	=	Total petroleum hydrocarbons as diesel analyzed using EPA Method 8015M.
TPHg	=	Total petroleum hydrocarbons as gasoline analyzed using EPA Method 8015M.
TPH-diesel Range	=	Concentration of hydrocarbons within diesel range, but reported by laboratory as not representative of diesel fuel; probably representative of aged gasoline; by EPA Method 8015M.
MTBE	=	Methyl tertiary butyl ether analyzed using EPA Method 8260B. Prior to 12/31/04 analyzed using EPA Method 8021B.
BTEX	=	Benzene, toluene, ethylbenzene, and total xylenes analyzed using EPA Method 8021B.
ETBE	=	Ethyl tertiary butyl ether analyzed using EPA Method 8260B.
TBA	=	Tertiary butyl alcohol analyzed using EPA Method 8260B.
DIPE	=	Di-isopropyl ether analyzed using EPA Method 8260B.
TAME	=	Tertiary amyl methyl ether analyzed using EPA Method 8260B.
1,2-DCA	=	1,2-Dichloroethane analyzed using EPA Method 8260B.
EDB	=	1,2-Dibromoethane analyzed using EPA Method 8260B.
Ethanol	=	Ethanol analyzed using EPA Method 8260B.
Methanol	=	Methanol analyzed using EPA Method 8015.
fbgs	=	Feet below ground surface.
$\mu\text{g}/\text{L}$	=	Micrograms per liter.
mg/L	=	Milligrams per liter.
---	=	Not measured/Not sampled/Not analyzed.
<	=	Analytes not detected at or above the laboratory reporting limit.
a	=	Hydrocarbons reported as diesel do not exhibit a typical diesel chromatographic pattern.
b	=	Quantified as diesel-range hydrocarbons consisting of aged gasoline with an unresolved C8-C26 range.
c	=	Analyzed using GC-MS.

TABLE 1B
ADDITIONAL CUMULATIVE GROUNDWATER MONITORING AND SAMPLING DATA
 Redwood Oil Facility 114
 1855 Guerneville Road
 Santa Rosa, California
 (Page 1 of 2)

Well	Sample	ETBE (µg/L)	TBA (µg/L)	DIPE (µg/L)	TAME (µg/L)	1,2-DCA (µg/L)	EDB (µg/L)	Ethanol (µg/L)	Methanol (mg/L)
ID	Date								
MW1	12/31/04	<5	<10	<5	<5	<0.5	<0.5	<100	---
MW1	04/22/05	<5	<10	<5	<5	<0.5	<0.5	<100	<0.5
MW1	08/24/05	<5.0	<10	<5.0	<5.0	<0.50	<0.50	<100	<0.50
MW1	03/08/06	<0.50	<5.0	<0.50	<0.50	<0.50	<0.50	<5.0	<0.050
MW2	12/31/04	<5	<10	<5	<5	<0.5	<0.5	<100	---
MW2	04/22/05	<25	<50	<25	<25	<2.5	<2.5	<500	<0.5
MW2	08/24/05	<25	<50	<25	<25	<2.5	<2.5	<500	<0.50
MW2	03/08/06	<0.50	<5.0	<0.50	<0.50	<0.50	<0.50	<5.0	<0.050
MW3	12/31/04	<5	<10	<5	<5	<0.5	<0.5	<100	---
MW3	04/22/05	<5	<10	<5	<5	<0.5	<0.5	<100	<0.5
MW3	08/24/05	<5.0	<10	<5.0	<5.0	<0.50	<0.50	<100	<0.50
MW3	03/08/06	<0.50	<5.0	<0.50	<0.50	<0.50	<0.50	<5.0	<0.050
MW4	12/31/04	<5	<10	<5	<5	<0.5	<0.5	<100	---
MW4	04/22/05	<5	<10	<5	<5	<0.5	<0.5	<100	<0.5
MW4	08/24/05	<5.0	<10	<5.0	<5.0	<0.50	<0.50	<100	<0.50
MW4	03/08/06	<0.50	<5.0	<0.50	<0.50	<0.50	<0.50	<5.0	<0.050
MW7	12/31/04	<10	<20	<10	<10	<1	<1	<200	---
MW7	04/22/05	<50	<100	<50	<50	<5	<5	<1,000	<0.5
MW7	08/24/05	<20	<300	<20	<20	<20	<20	<4,000	<0.50
MW7	03/08/06	<0.50	16	<0.50	<0.50	<0.50	<0.50	<5.0	<0.050
MW8	12/31/04	<5	<10	<5	<5	<0.5	<0.5	<100	---
MW8	04/22/05	<5	<10	<5	<5	<0.5	<0.5	<100	<0.5
MW8	08/24/05	<5.0	<10	<5.0	<5.0	<0.50	<0.50	<100	<0.50
MW8	03/08/06	<0.50	<5.0	<0.50	<0.50	<0.50	<0.50	<5.0	<0.050
MW9	12/31/04	<50	<100	<50	<50	<5	<5	<1,000	---
MW9	04/22/05	<100	<200	<100	<100	<10	<10	<2,000	<0.5
MW9	08/24/05	<100	<200	<100	<100	<10	<10	<2,000	<0.50
MW9	03/08/06	<0.50	<5.0	<0.50	<0.50	<0.50	<0.50	<5.0	<0.050
MW10	12/31/04	<5	<10	<5	<5	<0.5	<0.5	<100	---
MW10	04/22/05	<5	<10	<5	<5	<0.5	<0.5	<100	<0.5
MW10	08/24/05	<5.0	<10	<5.0	<5.0	<0.50	<0.50	<100	<0.50
MW10	03/08/06	<0.50	<5.0	<0.50	<0.50	<0.50	<0.50	<5.0	<0.050

TABLE 1B
ADDITIONAL CUMULATIVE GROUNDWATER MONITORING AND SAMPLING DATA

Redwood Oil Facility 114
 1855 Guerneville Road
 Santa Rosa, California
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Well ID	Sample Date	ETBE (µg/L)	TBA (µg/L)	DIPE (µg/L)	TAME (µg/L)	1,2-DCA (µg/L)	EDB (µg/L)	Ethanol (µg/L)	Methanol (mg/L)
MW11	12/31/04	<5	<10	<5	<5	<0.5	<0.5	<100	---
MW11	04/22/05	<5	<10	<5	<5	<0.5	<0.5	<100	<0.5
MW11	08/24/05	<5.0	<10	<5.0	<5.0	<0.50	<0.50	<100	<0.50
MW11	03/08/06	<0.50	<5.0	<0.50	<0.50	<0.50	<0.50	<5.0	<0.050

Notes:

Data collected prior to April, 2004 compiled from the ECM Group Systems Operations Report dated July 9, 2004.

TOC	=	Top of well casing elevation; datum is mean sea level.
DTW	=	Depth to water.
GW Elev.	=	Groundwater elevation; datum is mean sea level.
TPHd	=	Total petroleum hydrocarbons as diesel analyzed using EPA Method 8015M.
TPHg	=	Total petroleum hydrocarbons as gasoline analyzed using EPA Method 8015M.
MTBE	=	Methyl tertiary butyl ether analyzed using EPA Method 8021B.
BTEX	=	Benzene, toluene, ethylbenzene, and total xylenes analyzed using EPA Method 8021B.
ETBE	=	Ethyl tertiary butyl ether analyzed using EPA Method 8260B.
TBA	=	Tertiary butyl alcohol analyzed using EPA Method 8260B.
DIPE	=	Di-isopropyl ether analyzed using EPA Method 8260B.
TAME	=	Tertiary amyl methyl ether analyzed using EPA Method 8260B.
1,2-DCA	=	1,2-Dichloroethane analyzed using EPA Method 8260B.
EDB	=	1,2-Dibromoethane analyzed using EPA Method 8260B.
Ethanol	=	Ethanol analyzed using EPA Method 8260B.
Methanol	=	Methanol analyzed using EPA Method 8015.
fbgs	=	Feet below ground surface.
µg/L	=	Micrograms per liter.
mg/L	=	Milligrams per liter.
---	=	Not measured/Not sampled/Not analyzed.
<	=	Analytes not detected at or above the laboratory reporting limit.
a	=	Hydrocarbons reported as diesel do not exhibit a typical diesel chromatographic pattern.
b	=	Quantified as diesel-range hydrocarbons consisting of aged gasoline with an unresolved C8-C26 range.
c	=	Analyzed using GC-MS.

TABLE 2
CUMULATIVE MONITORING AND SAMPLING DATA FOR PRIVATE WATER WELL
AND WELL HEAD TREATMENT SYSTEM
 Redwood Oil Facility 114
 1855 Guerneville Road
 Santa Rosa, California
 (Page 1 of 4)

Well ID	Sample Date	Sample ID	TPHd ($\mu\text{g/L}$)	TPHg ($\mu\text{g/L}$)	MTBE ($\mu\text{g/L}$)	B ($\mu\text{g/L}$)	T ($\mu\text{g/L}$)	E ($\mu\text{g/L}$)	X ($\mu\text{g/L}$)	ETBE ($\mu\text{g/L}$)	TBA ($\mu\text{g/L}$)	DIPE ($\mu\text{g/L}$)	TAME ($\mu\text{g/L}$)	1,2-DCA ($\mu\text{g/L}$)	EDB ($\mu\text{g/L}$)	Ethanol ($\mu\text{g/L}$)	Methanol (mg/L)	
DW1815	01/31/05	---	---	---	<1	---	---	---	---	<5	<10	<5	<5	---	---	<100	<0.5	
DW1815	02/25/05	---	---	---	<1	---	---	---	---	<5	<10	<5	<5	---	---	<100	<0.5	
DW1815	03/30/05	---	---	---	<1	---	---	---	---	<5	<10	<5	<5	---	---	<100	<0.5	
DW1815	04/22/05	---	---	---	<1	---	---	---	---	<5	<10	<5	<5	---	---	<100	<0.50	
DW1815	05/20/05	---	---	---	<1.0	---	---	---	---	<5.0	<10.0	<5.0	<5.0	---	---	<100	<0.50	
DW1815	06/17/05	---	---	---	1.3	---	---	---	---	<5.0	<10	<5.0	<5.0	<0.50	<0.50	<100	0.84b	
DW1815	07/22/05 a	---	---	---	18.0	---	---	---	---	<5.0	<10	<5.0	<5.0	---	---	<100	<0.50b	
DW1815	08/05/05	---	---	---	1.2	---	---	---	---	<5.0	<10	<5.0	<5.0	---	---	<100	<0.50	
DW1815	09/23/05	---	---	---	1.1	---	---	---	---	<5.0	<10	<5.0	<5.0	---	---	<100	<0.50	
DW1815	October 2005 - Treatment system installed.																	
DW1815	10/19/05	W-INF	---	---	1.1	---	---	---	---	<5.0	<10	<5.0	<5.0	<0.50	<0.50	<100	<0.50	
		W-INT	---	---	<1.0	---	---	---	---	<5.0	<10	<5.0	<5.0	<0.50	<0.50	<100	0.83c	
		W-EFF	---	---	<1.0	---	---	---	---	<5.0	<10	<5.0	<5.0	<0.50	<0.50	<100	<0.50	
DW1815	11/18/05	W-INF	<50	<50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<5.0	<0.50	<0.50	<5.0	<50	
		W-INT	54d	<50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<5.0	<0.50	<0.50	<5.0	<50	
		W-EFF	<50	<50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<5.0	<0.50	<0.50	<5.0	<50	
DW1815	12/29/05	W-INF	<50	<25	1.3	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<10	<5.0	<5.0	<5.0	<5.0	<5.0	
		W-INT	<50	<25	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<10	<5.0	<5.0	<5.0	<5.0	<5.0	
		W-EFF	<50	<25	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<10	<5.0	<5.0	<5.0	<5.0	<5.0	
DW1815	01/31/06	W-INF	<50	<50	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<10	<5.0	<5.0	<0.50	<0.50	<100	<0.50
		W-INT	<50	<50	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<10	<5.0	<5.0	<0.50	<0.50	<100	<0.50
		W-EFF	<50	<50	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<10	<5.0	<5.0	<0.50	<0.50	<100	<0.50
DW1815	02/27/06	W-INF	<50	<50	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<10	<5.0	<5.0	<0.50	<0.50	<100	<0.50
		W-INT	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
		W-EFF	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
DW1815	03/17/06	W-INF	<50	<50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<10	<0.50	<0.50	<0.50	<5.0	<0.050	
DW2050	04/21/99	---	<50	<50	5	0.5	0.5	0.5	0.5	0.5	---	---	---	---	---	---	---	
DW2050	08/11/99	---	<50	<50	0.5	0.5	0.5	0.5	0.5	0.5	---	---	---	---	---	---	---	
DW2050	10/28/99	---	<50	<50	0.5	0.5	0.5	0.5	0.5	0.5	---	---	---	---	---	---	---	
DW2050	02/04/00	---	<50	<50	0.5	0.5	0.5	0.5	0.5	0.5	---	---	---	---	---	---	---	
DW2050	05/01/00	---	<50	<50	2	0.5	0.5	0.5	0.5	0.5	---	---	---	---	---	---	---	
DW2050	07/25/00	---	<50	<50	2	0.5	0.5	0.5	0.5	0.5	---	---	---	---	---	---	---	
DW2050	10/26/00	---	<50	<50	0.5	0.5	0.5	0.5	0.5	0.5	---	---	---	---	---	---	---	
DW2050	01/17/01	---	<50	<50	5	0.5	0.5	0.5	0.5	0.5	---	---	---	---	---	---	---	
DW2050	04/24/01	---	<50	<50	5	0.5	0.5	0.5	0.5	0.5	---	---	---	---	---	---	---	
DW2050	07/31/01	---	<50	<50	5	0.5	0.5	0.5	0.5	0.5	---	---	---	---	---	---	---	
DW2050	12/05/01	---	<50	<50	<5	0.5	0.5	0.5	0.5	0.5	---	---	---	---	---	---	---	
DW2050	01/31/02	---	<50	<50	<5	0.5	0.5	0.5	0.5	0.5	---	---	---	---	---	---	---	
DW2050	04/17/02	---	<50	<50	2	<1	<1	<1	<1	<1	---	---	---	---	---	---	---	
DW2050	05/24/02	---	<50	<50	<5	0.5	0.5	0.5	0.5	0.5	---	---	---	---	---	---	---	
DW2050	07/10/02	---	<50	<50	4	<1	<1	<1	<1	<1	---	---	---	---	---	---	---	

TABLE 2
CUMULATIVE MONITORING AND SAMPLING DATA FOR PRIVATE WATER WELL
AND WELL HEAD TREATMENT SYSTEM
 Redwood Oil Facility 114
 1855 Guerneville Road
 Santa Rosa, California
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Well ID	Sample Date	Sample ID	TPHd ($\mu\text{g/L}$)	TPHg ($\mu\text{g/L}$)	MTBE ($\mu\text{g/L}$)	B ($\mu\text{g/L}$)	T ($\mu\text{g/L}$)	E ($\mu\text{g/L}$)	X ($\mu\text{g/L}$)	ETBE ($\mu\text{g/L}$)	TBA ($\mu\text{g/L}$)	DIPE ($\mu\text{g/L}$)	TAME ($\mu\text{g/L}$)	1,2-DCA ($\mu\text{g/L}$)	EDB ($\mu\text{g/L}$)	Ethanol ($\mu\text{g/L}$)	Methanol (mg/L)
DW2050	08/07/02	---	<50	<50	<5	0.5	0.5	0.5	<1	---	---	---	---	---	---	---	
DW2050	10/10/02	---	<50	<50	5.7	0.5	0.5	0.5	<1	---	---	---	---	---	---	---	
DW2050	01/13/03	---	<50	<50	4.4	0.5	0.5	0.5	<1	---	---	---	---	---	---	---	
DW2050	04/16/03	---	<50	<50	4	<1	<1	<1	<1	---	---	---	---	---	---	---	
DW2050	07/16/03	---	<50	<50	9	<1	<1	<1	<1	---	---	---	---	---	---	---	
DW2050	10/21/03	---	<50	<50	11	<1	<1	<1	<1	---	---	---	---	---	---	---	
DW2050	04/06/04	---	<50	<50	6.4	0.5	0.5	0.5	<1	---	---	---	---	---	---	---	
DW2050	12/31/04	---	<50	<50	27	<0.5	<0.5	<0.5	<0.5	<5	<10	<5	<5	<0.5	<0.5	<100	
DW2050	01/31/05	---	---	---	22	---	---	---	---	22	<5	<10	<5	<5	<100	<0.5	
DW2050	02/25/05	---	---	---	19	---	---	---	---	<5	<10	<5	<5	---	---	<100	
DW2050	03/30/05	---	---	---	15	---	---	---	---	<5	<10	<5	<5	---	---	<0.5	
DW2050	04/22/05	---	---	---	20	---	---	---	---	<5	<10	<5	<5	---	---	<100	
DW2050	05/20/05	---	---	---	7.6	---	---	---	---	<5.0	<10.0	<5.0	<5.0	---	---	<0.50	
DW2050	06/17/05	---	---	---	16	---	---	---	---	<5.0	<10	<5.0	<5.0	<0.50	<0.50	<0.50	
DW2050	07/22/05 a	---	---	---	<1.0	---	---	---	---	<5.0	<10	<5.0	<5.0	---	---	<100	
DW2050	08/05/05	---	---	---	20	---	---	---	---	<5.0	<10	<5.0	<5.0	---	---	2.1b	
DW2050	09/23/05	---	---	---	26	---	---	---	---	<5.0	<10	<5.0	<5.0	---	---	<100	
DW2050	October 2005 - Treatment system installed.																
DW2050	10/19/05	W-INF	---	---	20.0	---	---	---	---	<5.0	<10	<5.0	<5.0	<0.50	<0.50	<100	
		W-INT	---	---	<1.0	---	---	---	---	<5.0	<10	<5.0	<5.0	<0.50	<0.50	<0.50	
		W-EFF	---	---	<1.0	---	---	---	---	<5.0	<10	<5.0	<5.0	<0.50	<0.50	<0.50	
DW2050	11/18/05	W-INF	<50	<50	20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<0.50	<0.50	<0.50	<50	
		W-INT	<50	<50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<0.50	<0.50	<0.50	<50	
		W-EFF	<50	<50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<0.50	<0.50	<0.50	<50	
DW2050	12/29/05	W-INF	<50	<25	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<10	<5.0	<5.0	---	---	
		W-INT	<50	<25	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<10	<5.0	<5.0	---	---	
		W-EFF	<50	<25	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<10	<5.0	<5.0	---	---	
DW2050	01/27/06	W-INF	<50	<50	3.9	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<10	<5.0	<5.0	<0.50	<100	
		W-INT	<50	<50	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<10	<5.0	<5.0	<0.50	<0.50	
		W-EFF	<50	<50	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<10	<5.0	<5.0	<0.50	<100	
DW2050	02/27/06	W-INF	<50	<50	3.5	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<10	<5.0	<5.0	<0.50	<100	
		W-INT	---	---	<1.0	---	---	---	---	---	---	---	---	---	---		
		W-EFF	---	---	<1.0	---	---	---	---	---	---	---	---	---	---		
DW2050	03/08/06	W-INF	<50	<50	2.4	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<0.50	<0.50	<0.50	<5.0	<0.050	
		W-INT	---	---	<0.50	---	---	---	---	---	---	---	---	---	---		
		W-EFF	---	---	<0.50	---	---	---	---	---	---	---	---	---	---		
DW2075	07/24/01	---	<50	<50	5	0.5	0.5	0.5	0.5	---	---	---	---	---	---	---	
DW2075	12/05/01	---	<50	<50	<5	0.5	0.5	0.5	0.5	---	---	---	---	---	---	---	
DW2075	01/31/02	---	<50	<50	<5	0.5	0.5	0.5	0.5	---	---	---	---	---	---	---	
DW2075	04/17/02	---	<50	<50	<1	<1	<1	<1	<1	---	---	---	---	---	---	---	
DW2075	07/10/02	---	<50	<50	<1	<1	<1	<1	<1	---	---	---	---	---	---	---	
DW2075	10/10/02	---	<50	<50	<5	0.5	0.5	0.5	0.5	---	---	---	---	---	---	---	
DW2075	01/13/03	---	<50	<50	<1	0.5	0.5	0.5	<1	---	---	---	---	---	---	---	
DW2075	04/16/03	---	<50	<50	<1	<1	<1	<1	<1	---	---	---	---	---	---	---	

TABLE 2
**CUMULATIVE MONITORING AND SAMPLING DATA FOR PRIVATE WATER WELL
AND WELL HEAD TREATMENT SYSTEM**

Redwood Oil Facility 114
1855 Guerneville Road
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TABLE 2
CUMULATIVE MONITORING AND SAMPLING DATA FOR PRIVATE WATER WELL
AND WELL HEAD TREATMENT SYSTEM
 Redwood Oil Facility 114
 1855 Guerneville Road
 Santa Rosa, California
 (Page 4 of 4)

Well ID	Sample Date	Sample ID	TPHd ($\mu\text{g/L}$)	TPHg ($\mu\text{g/L}$)	MTBE ($\mu\text{g/L}$)	B ($\mu\text{g/L}$)	T ($\mu\text{g/L}$)	E ($\mu\text{g/L}$)	X ($\mu\text{g/L}$)	ETBE ($\mu\text{g/L}$)	TBA ($\mu\text{g/L}$)	DIPE ($\mu\text{g/L}$)	TAME ($\mu\text{g/L}$)	1,2-DCA ($\mu\text{g/L}$)	EDB ($\mu\text{g/L}$)	Ethanol ($\mu\text{g/L}$)	Methanol (mg/L)
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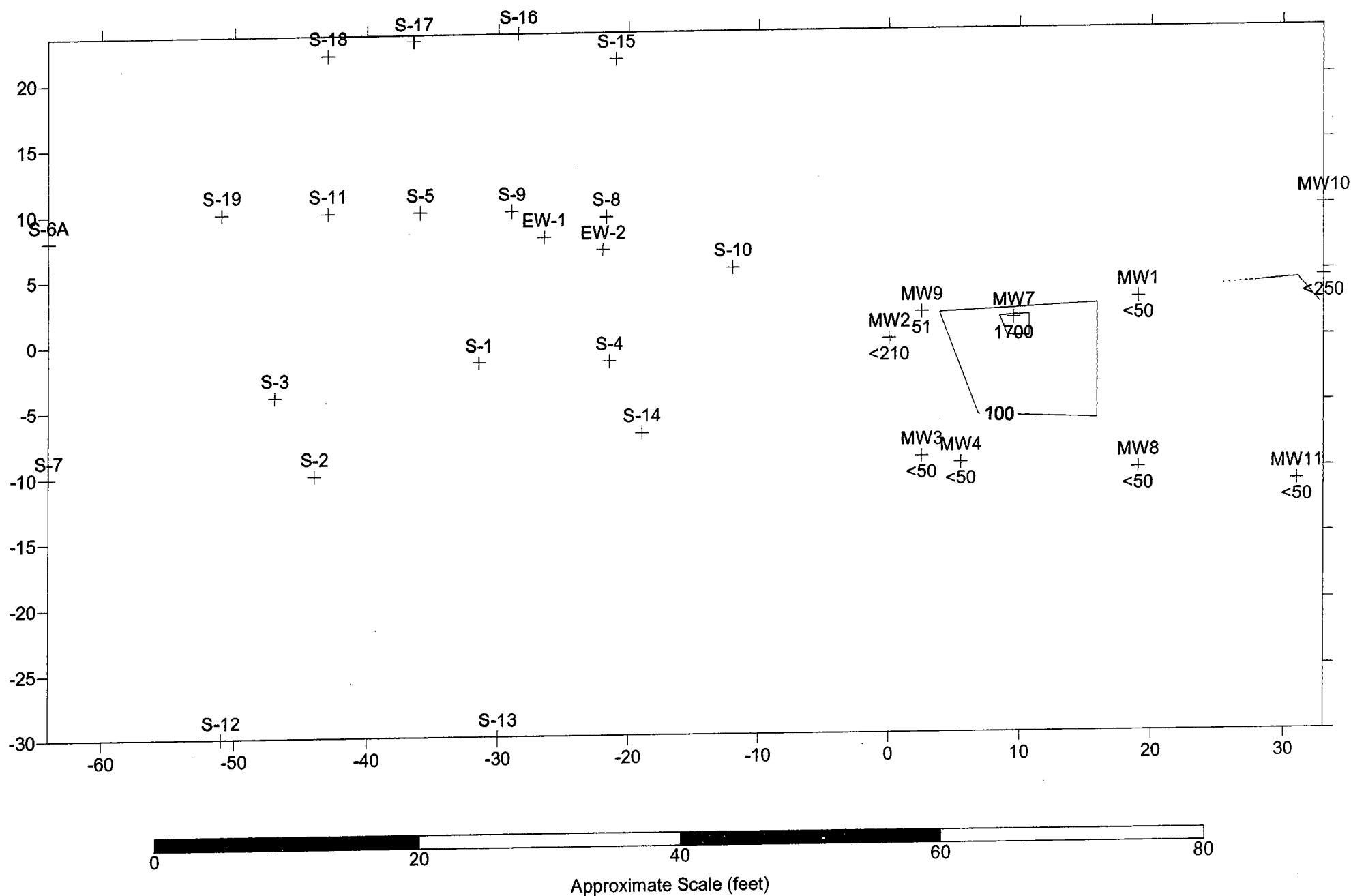
Notes:

Data collected prior to April, 2004 compiled from the ECM Group Systems Operations Report dated July 9, 2004.

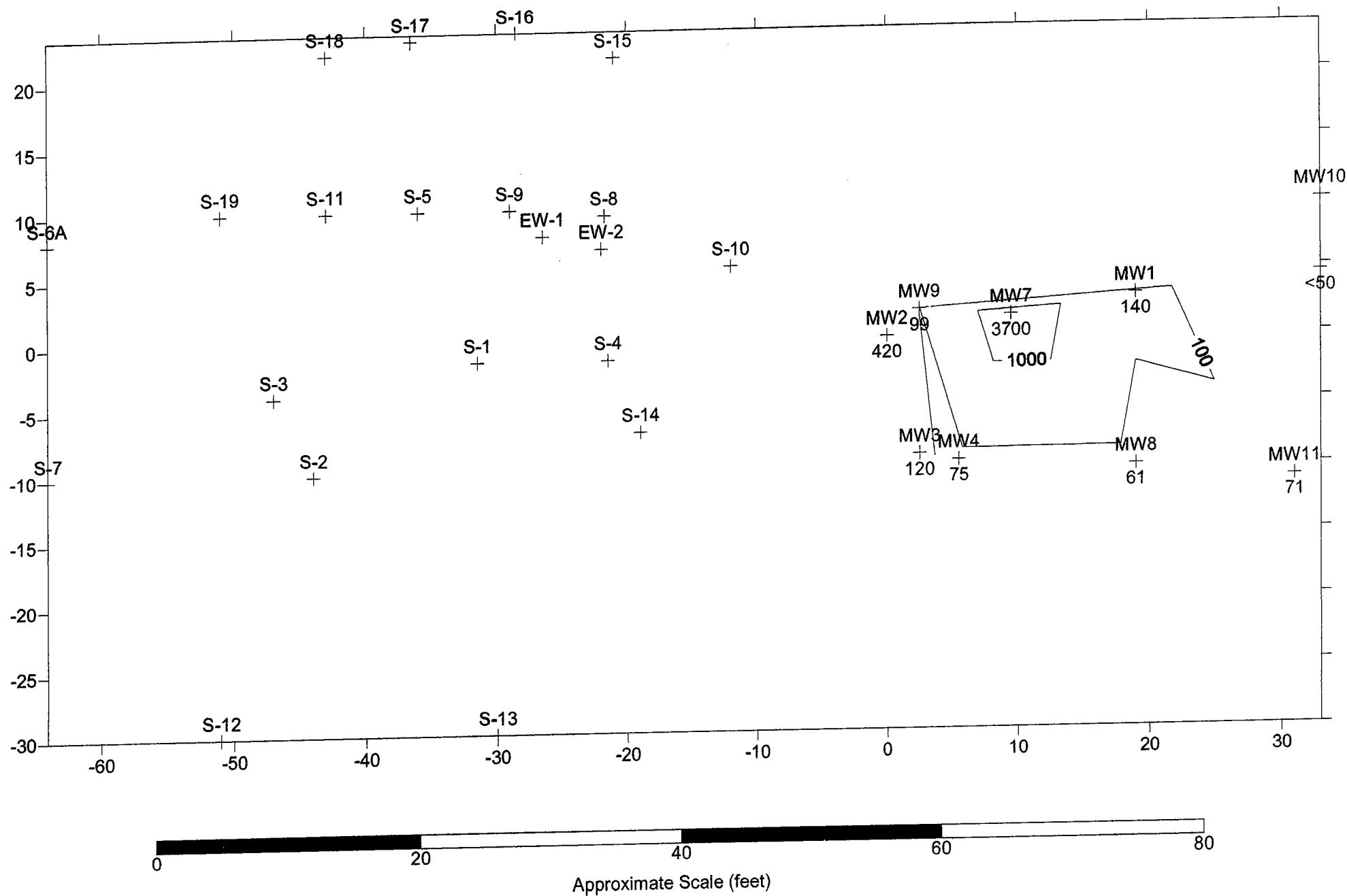
TPHd	=	Total petroleum hydrocarbons as diesel analyzed using EPA Method 8015M.
TPHg	=	Total petroleum hydrocarbons as gasoline analyzed using EPA Method 8260B. Prior to 10/19/05, analyzed using EPA Method 8015M.
MTBE	=	Methyl tertiary butyl ether analyzed using EPA Method 8260B. Prior to 12/31/04 analyzed using EPA Method 8021B.
BTEX	=	Benzene, toluene, ethylbenzene, and total xylenes analyzed using EPA Method 8260B. Prior to 10/19/05, analyzed using EPA Method 8021B.
ETBE	=	Ethyl tertiary butyl ether analyzed using EPA Method 8260B.
TBA	=	Tertiary butyl alcohol analyzed using EPA Method 8260B.
DIPE	=	Di-isopropyl ether analyzed using EPA Method 8260B.
TAME	=	Tertiary amyl methyl ether analyzed using EPA Method 8260B.
1,2-DCA	=	1,2-Dichloroethane analyzed using EPA Method 8260B.
EDB	=	1,2-Dibromoethane analyzed using EPA Method 8260B.
Ethanol	=	Ethanol analyzed using EPA Method 8260B.
Methanol	=	Methanol analyzed using EPA Method 8015.
$\mu\text{g/L}$	=	Micrograms per liter.
mg/L	=	Milgrams per liter.
---	=	Not measured/Not sampled/Not analyzed.
<	=	Analytes not detected at or above the laboratory reporting limit.
a	=	Results not consistent with historical trend; samples for DW1815, DW2050, and DW2075 likely mislabeled in field.
b	=	Methanol results updated on 10/10/05
c	=	Methanol detection in intermediate port sample likely due to laboratory contamination.
d	=	Hydrocarbons reported as TPH as diesel do not exhibit a typical diesel chromatographic pattern.

APPENDIX E
ISOCONCENTRATION MAPS
(APRIL 6, 2004, APRIL 22, 2005, MARCH 8, 2006)

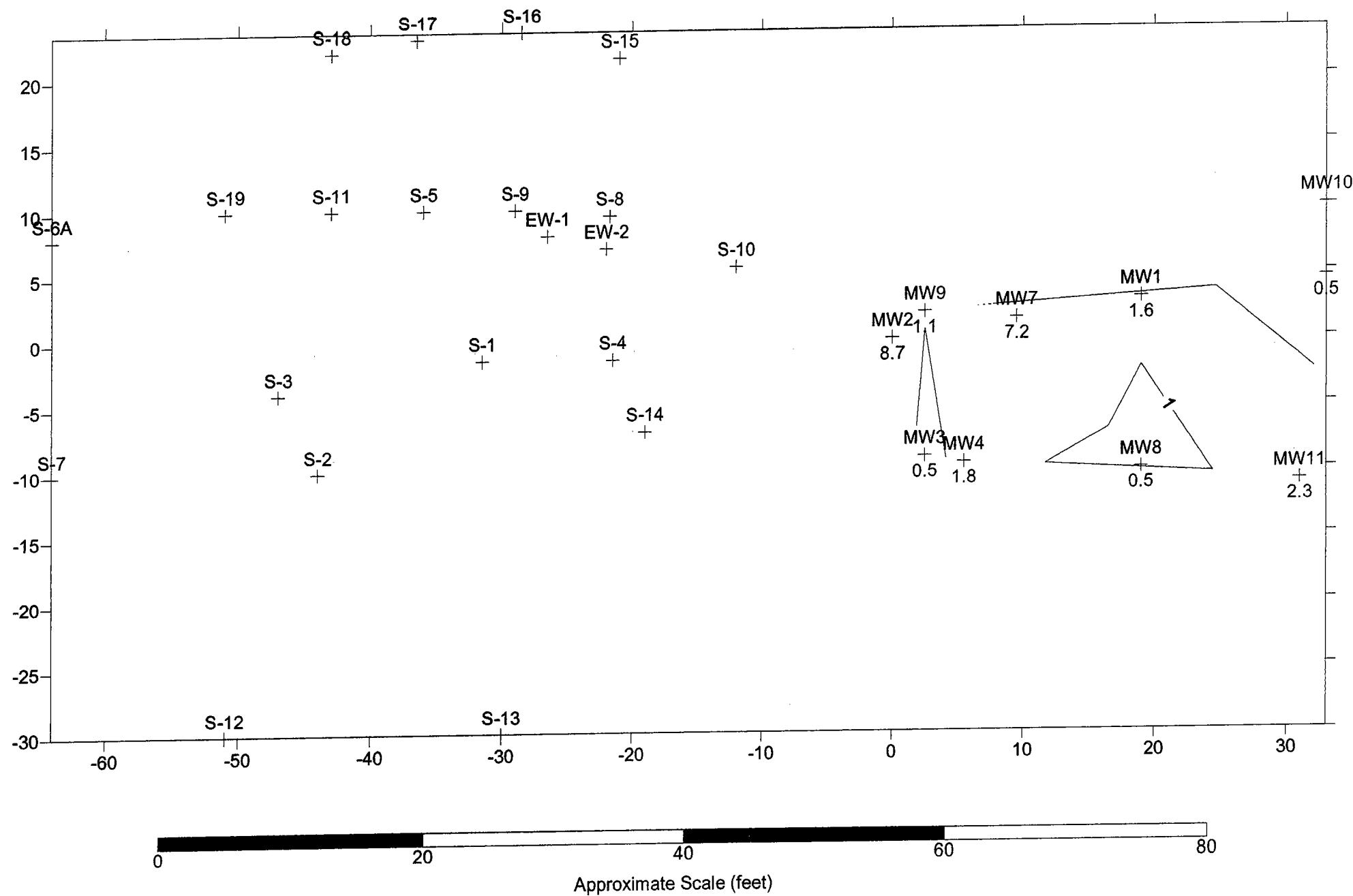
TPHd Isoconcentration Map
April 6, 2004



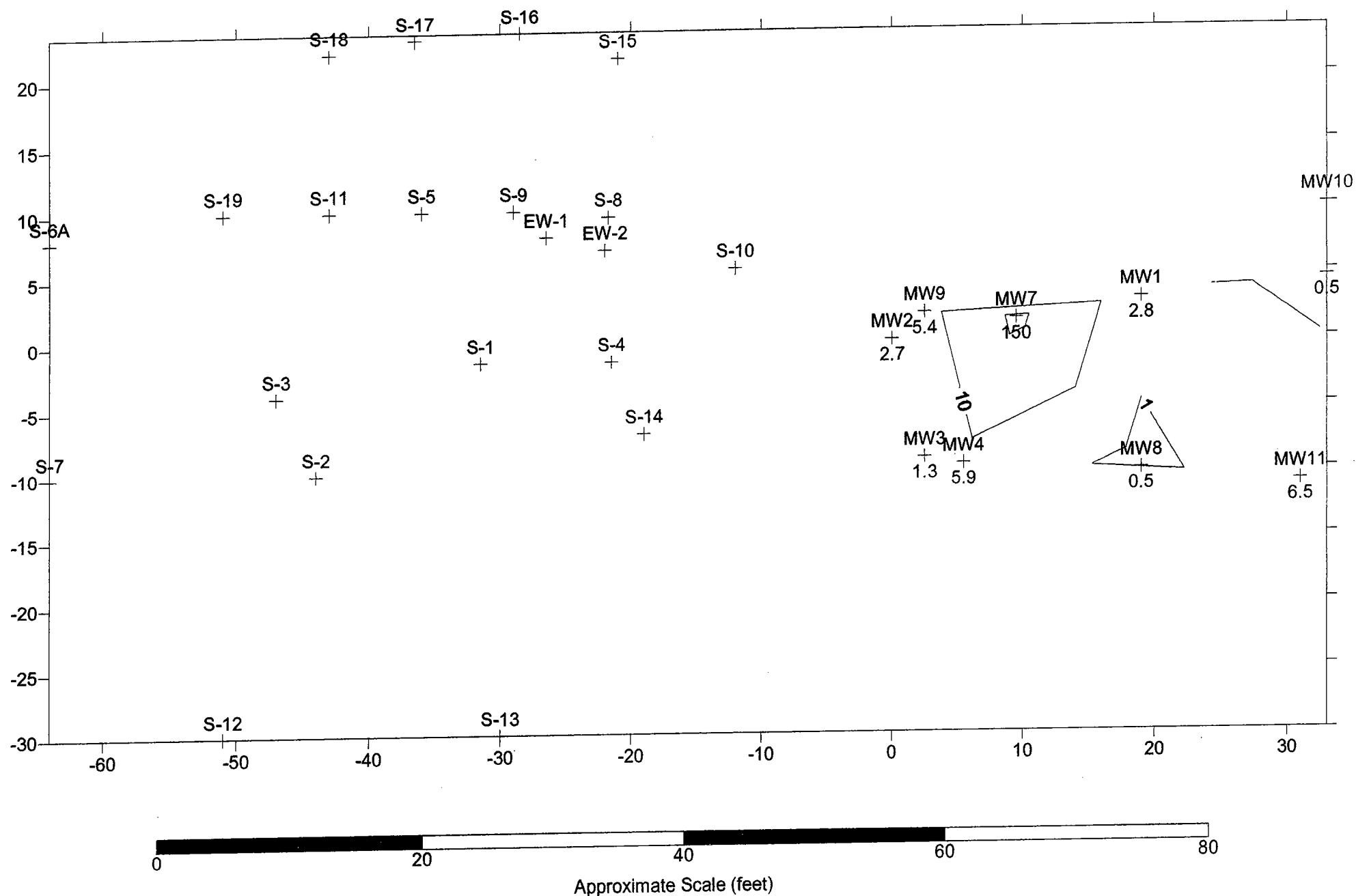
TPHg Isoconcentration Map April 6, 2004



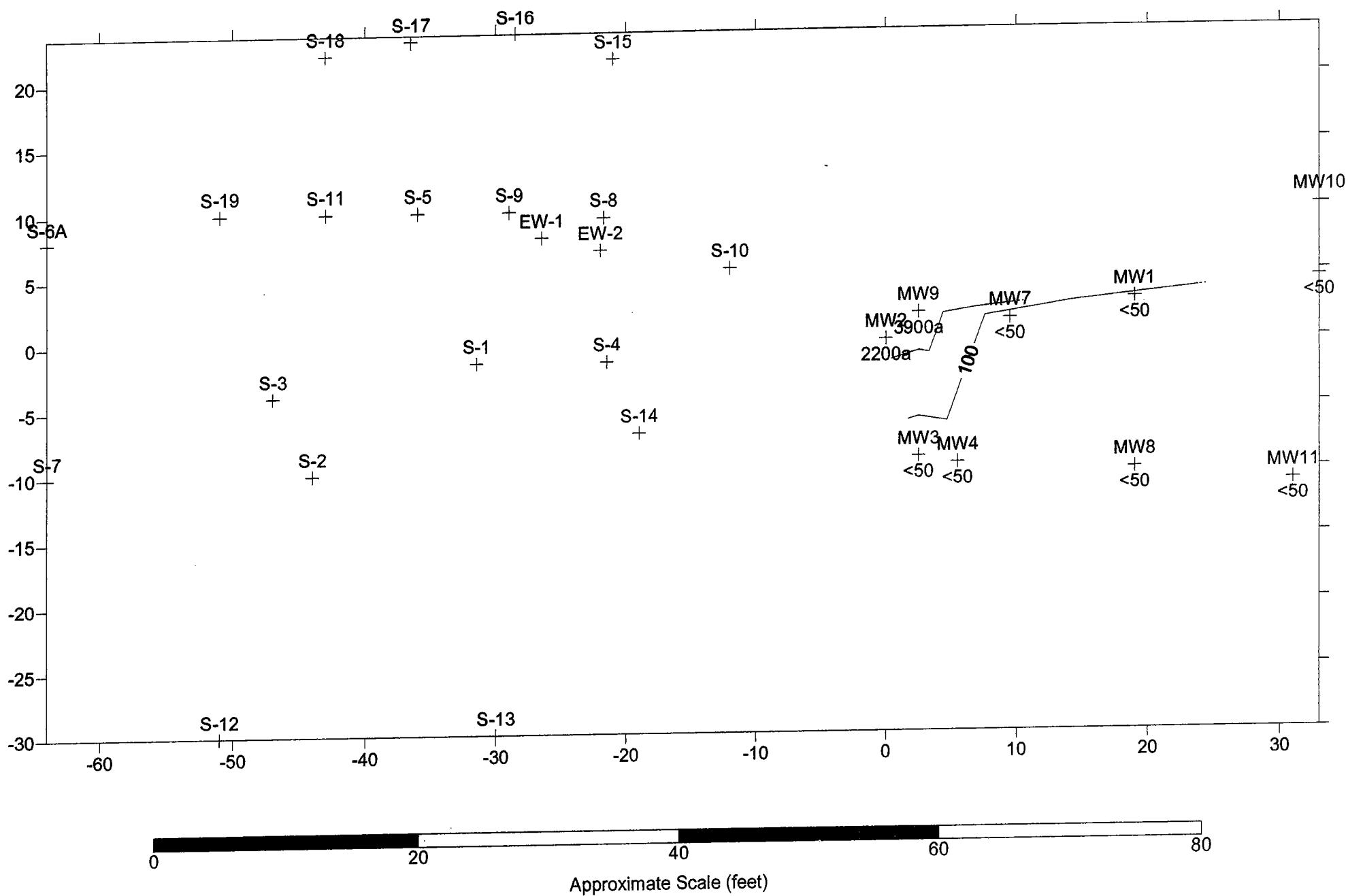
MTBE Isoconcentration Map
April 6, 2004



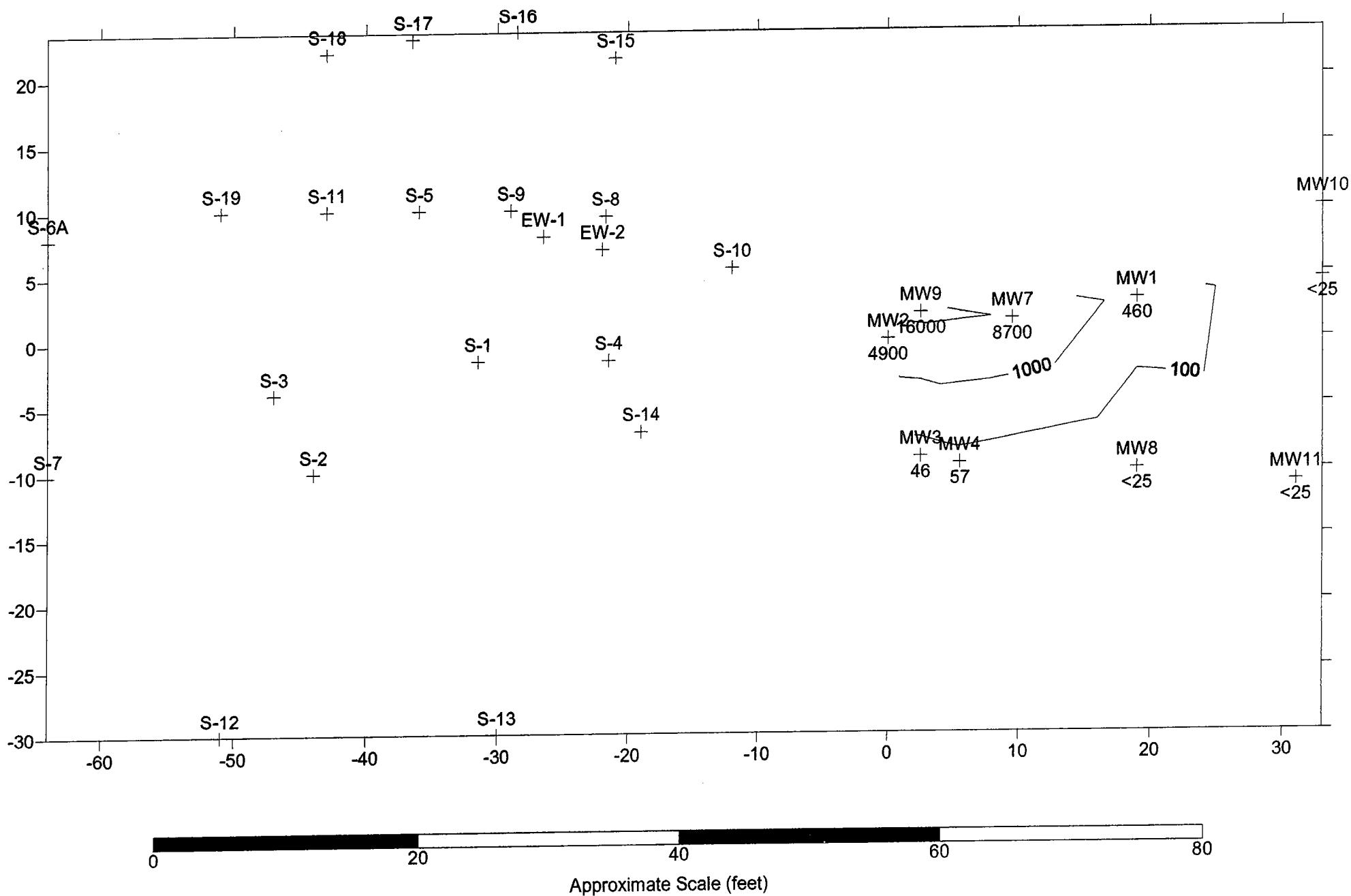
Benzene Isoconcentration Map
April 6, 2004



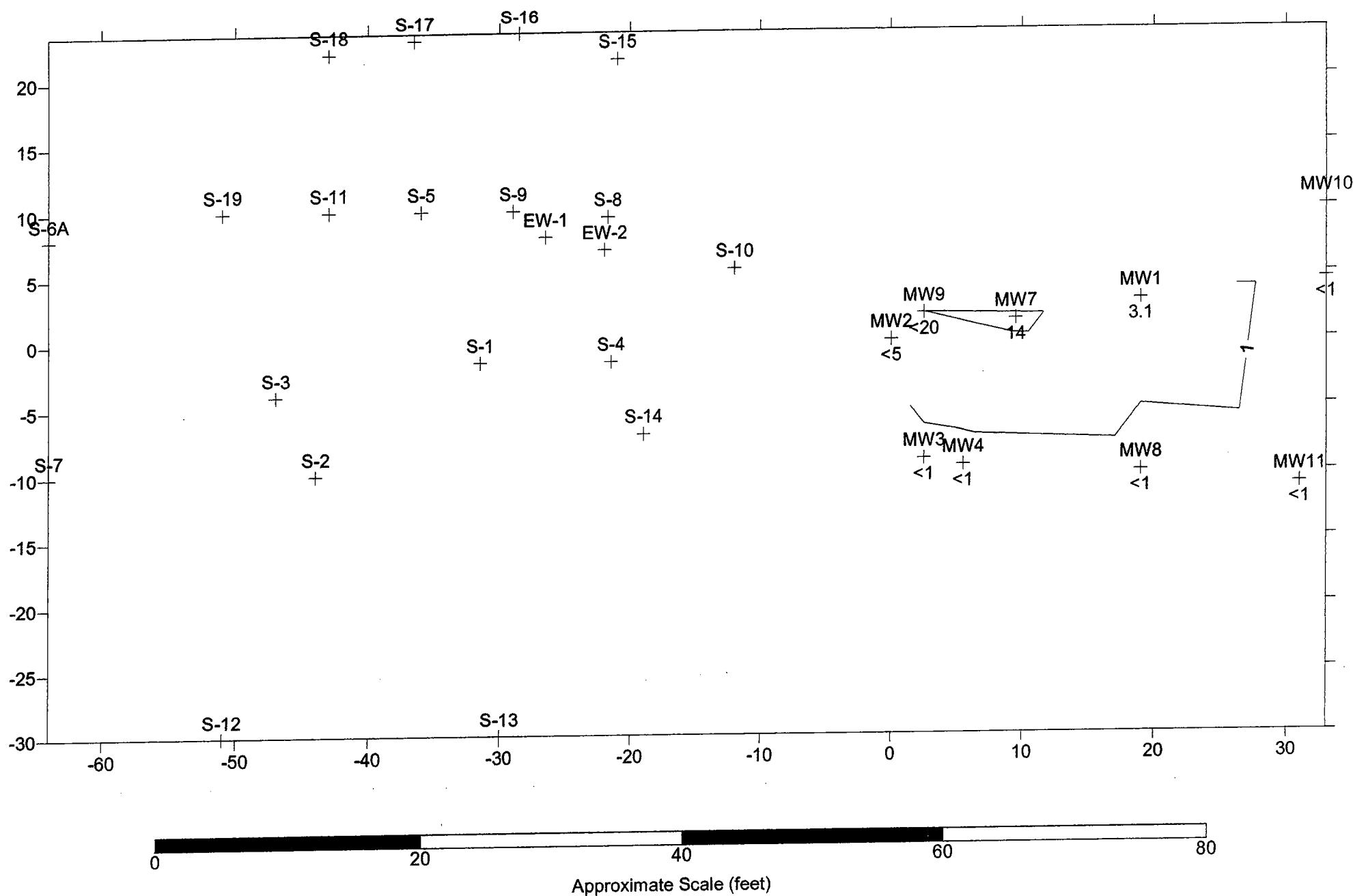
TPHd Isoconcentration Map
April 22, 2005



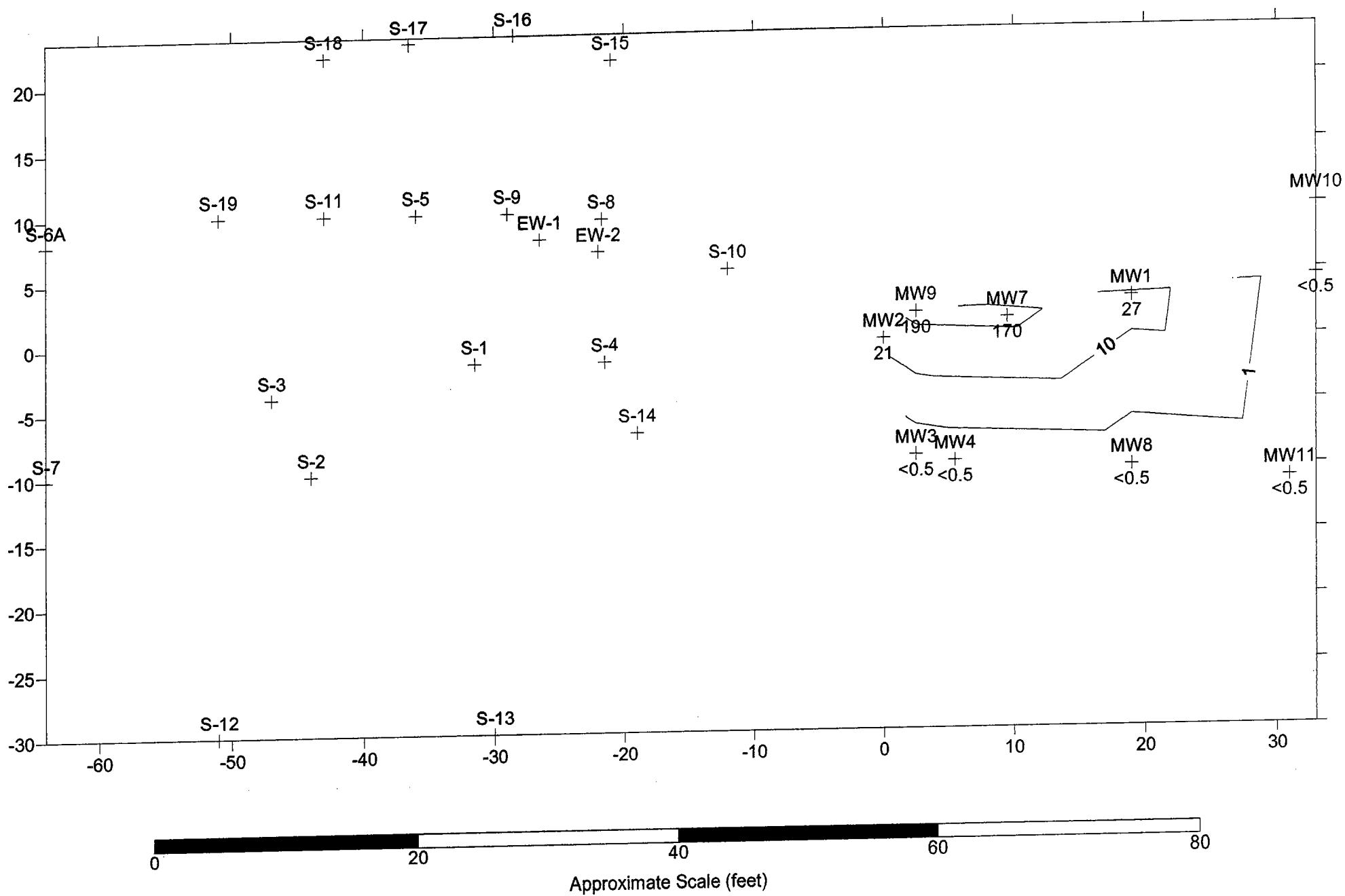
TPHg Isoconcentration Map
April 22, 2005



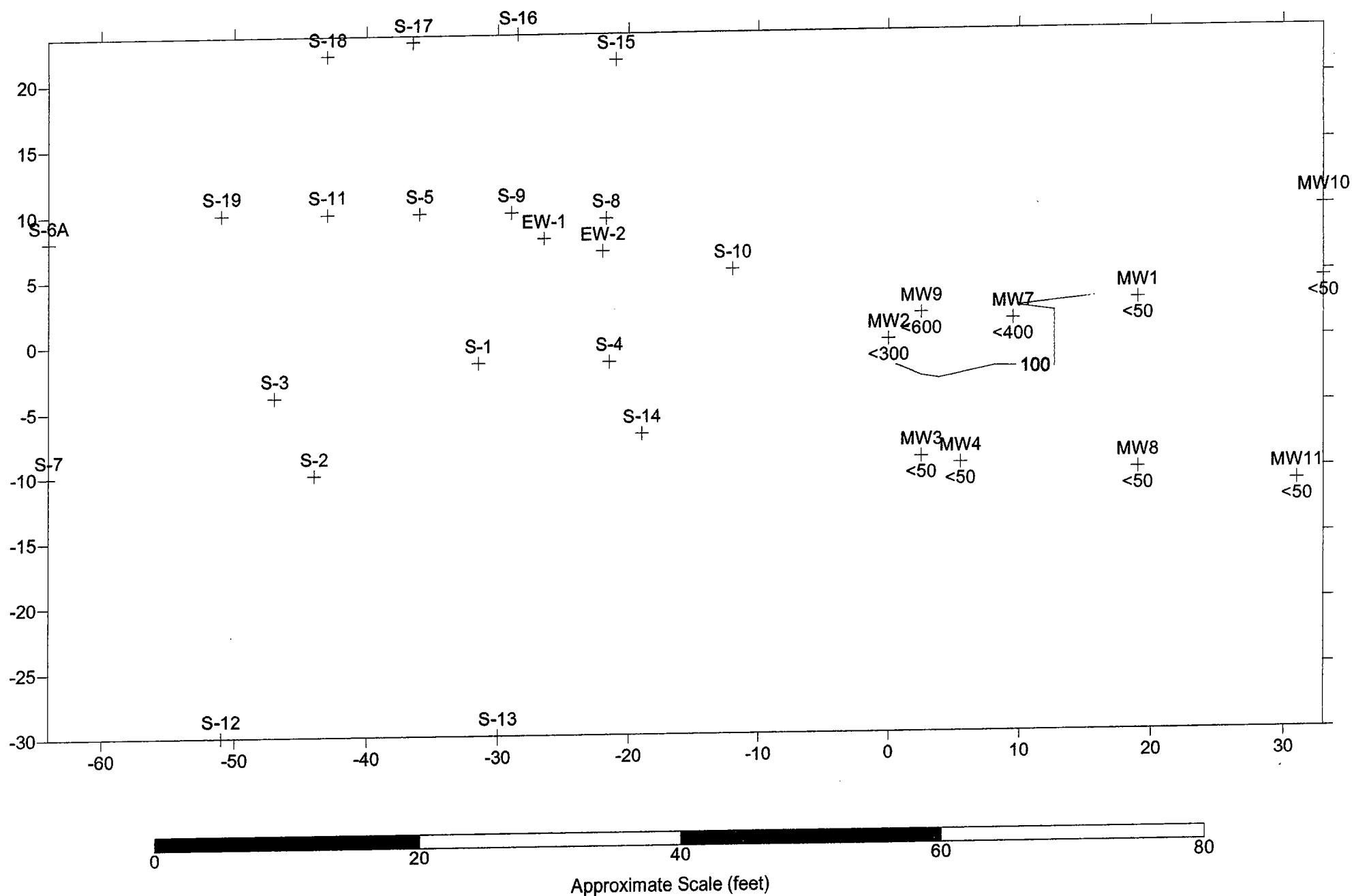
MTBE Isoconcentration Map
April 22, 2005



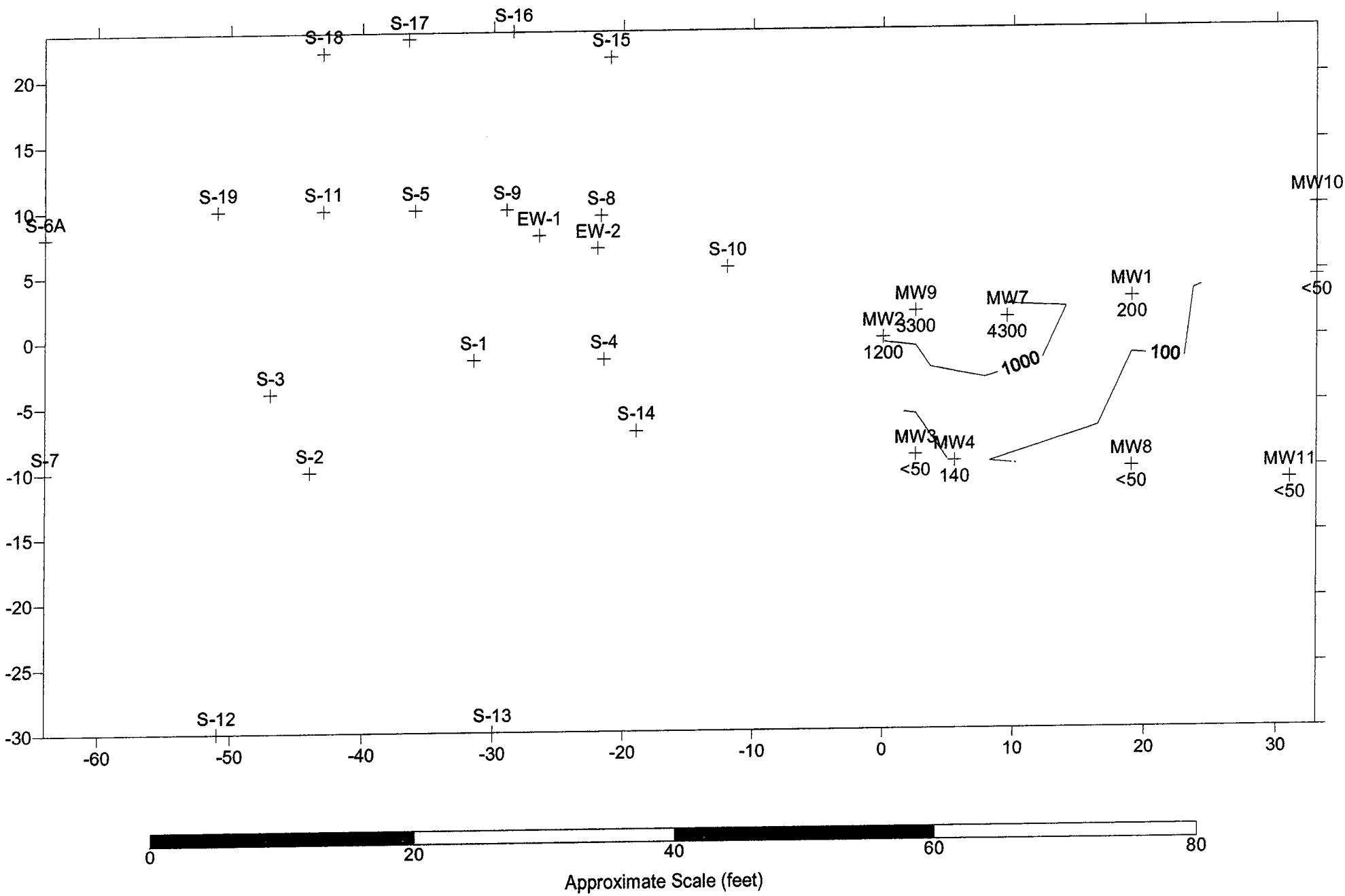
Benzene Isoconcentration Map
April 22, 2005



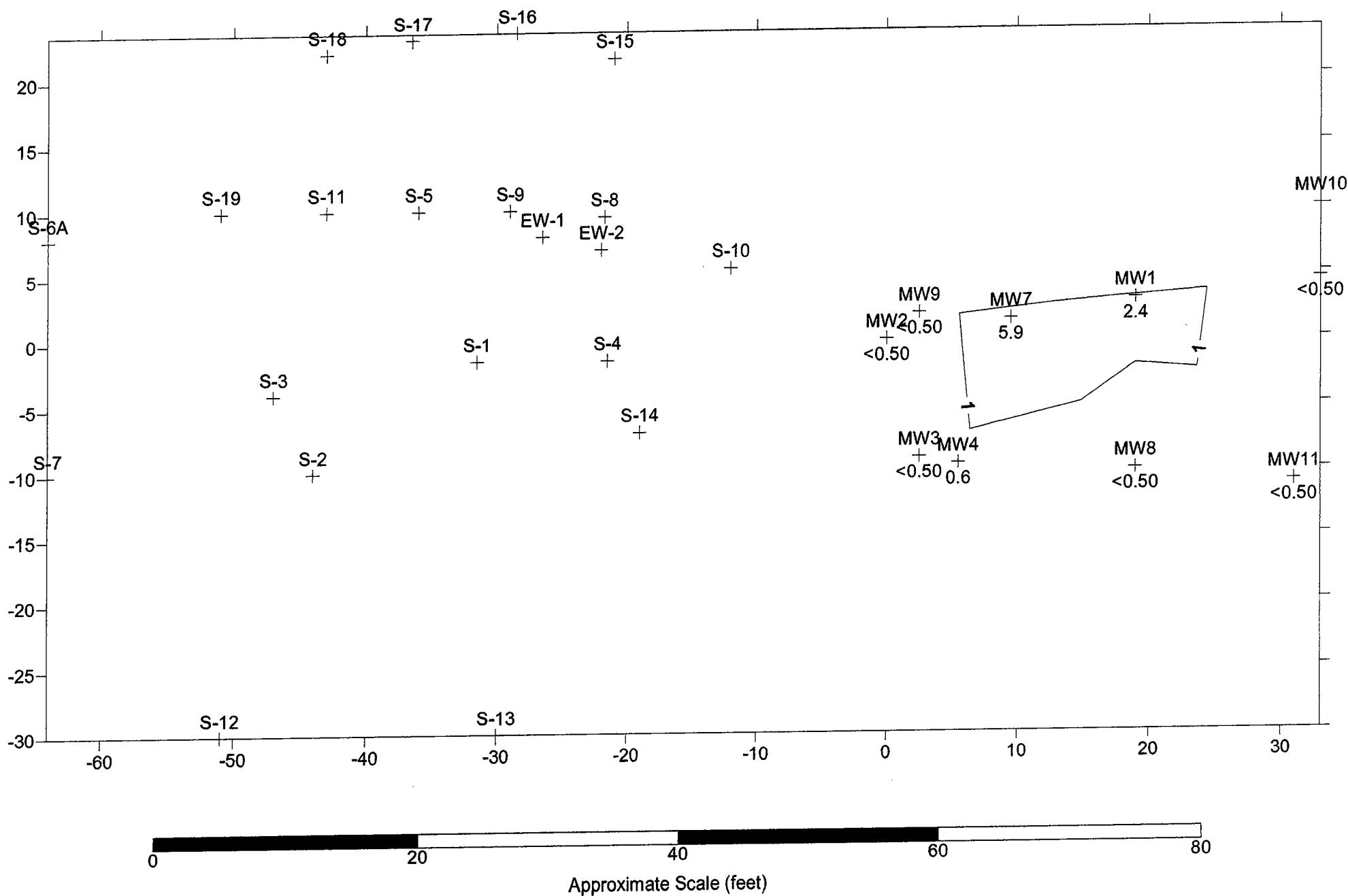
TPHd Isoconcentration Map
March 8, 2006



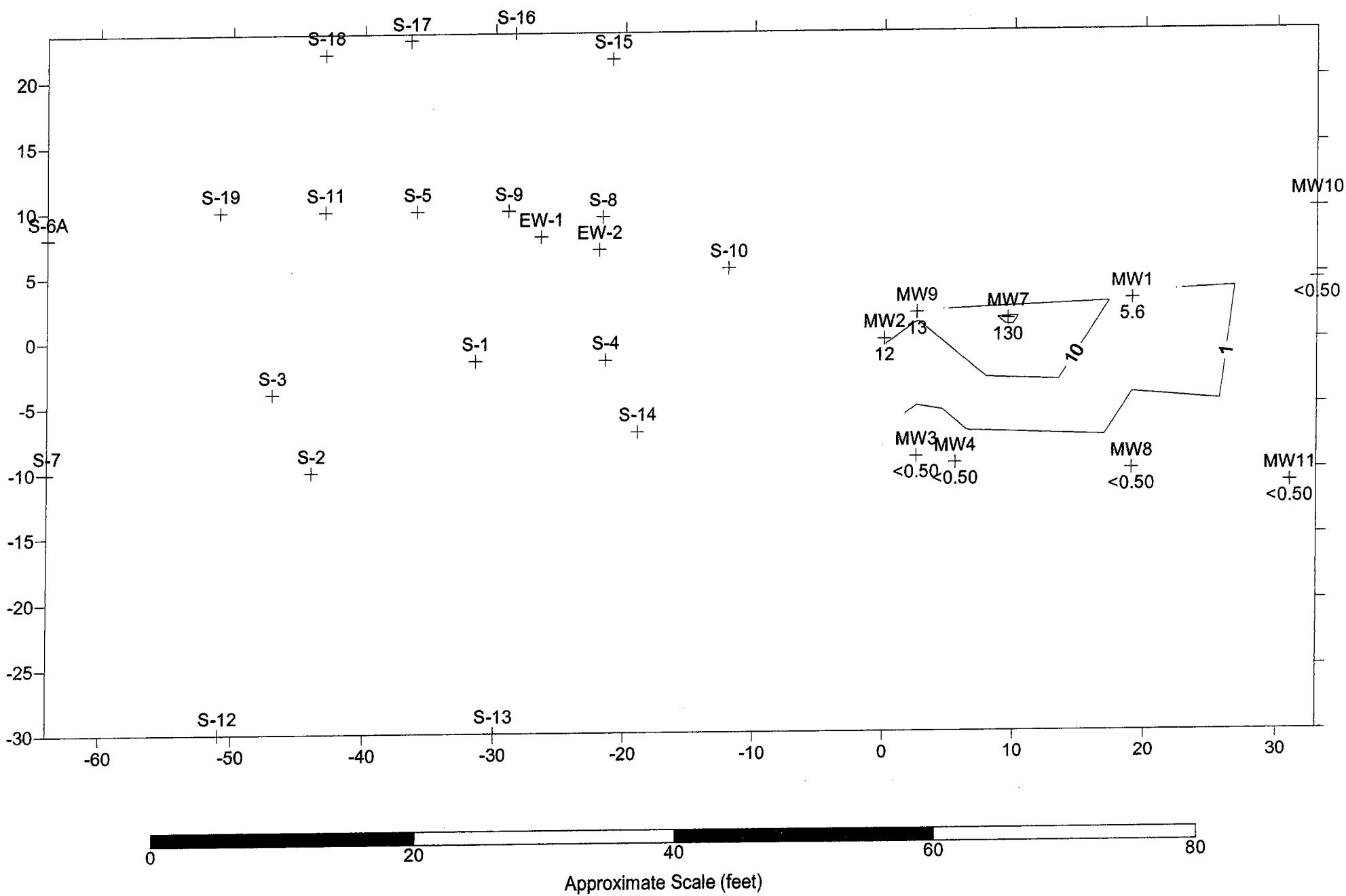
TPHg Isoconcentration Map March 8, 2006



MTBE Isoconcentration Map
March 8, 2006



Benzene Isoconcentration Map
March 8, 2006



APPENDIX F

OPERATION AND PERFORMANCE DATA FOR GROUNDWATER EXTRACTION AND TREATMENT SYSTEM

TABLE 2
OPERATIONAL AND PERFORMANCE DATA FOR GROUNDWATER EXTRACTION AND TREATMENT SYSTEM

Redwood Oil Facility 114
1855 Guerneville Road
Santa Rosa, California
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TABLE 2
OPERATIONAL AND PERFORMANCE DATA FOR GROUNDWATER EXTRACTION AND TREATMENT SYSTEM
 Redwood Oil Facility 114
 1855 Guerneville Road
 Santa Rosa, California
 (Page 2 of 5)

Date	Effluent Totalizer	Total Flow	Average Flowrate	Sample ID	TPHg (µg/L)	TPHd (µg/L)	B (µg/L)	T (µg/L)	E (µg/L)	X (µg/L)	MTBE (µg/L)	Other VOCs (µg/L)	TPHg Removed		MTBE Removed	
	(gal)	(gal)	(gpm)										Per Period (lbs)	Cumulative (lbs)	Per Period (lbs)	Cumulative (lbs)
07/19/02	739,515	2,103,531	1.00													
07/23/02	744,634	2,108,650	0.89													
07/29/02	748,651	2,112,667	0.46													
08/07/02	759,332	2,123,348	0.82		700	340	28	9	2.8		44.00	10			0.50	2.75
08/15/02	767,593	2,131,609	0.72													
08/21/02	774,911	2,138,927	0.85													
08/30/02	785,388	2,149,404	0.81													
09/04/02	791,259	2,155,275	0.82													
09/13/02	801,484	2,165,500	0.79													
09/19/02	808,220	2,172,236	0.78													
09/29/02	815,900	2,179,916	0.53													
10/02/02	822,900	2,186,916	1.62													
10/10/02	831,174	2,195,190	0.72													
10/18/02	831,188	2,195,204	0.00													
10/25/02	831,439	2,195,455	0.02													
10/30/02	837,624	2,201,640	0.86													
11/05/02	843,960	2,207,976	0.73		130	150	1.3	< 0.5	< 0.5		2.20	9			0.29	3.04
11/21/02	847,216	2,211,232	0.14													
11/27/02	855,167	2,219,183	0.92													
12/06/02	866,774	2,230,790	0.90													
12/13/02	876,287	2,240,303	0.94													
12/17/02	888,451	2,252,467	2.11													
12/27/02	916,240	2,280,256	1.93													
01/24/03	917,807	2,281,823	0.04													
01/28/03	935,181	2,299,197	3.02													
02/05/03	935,181	2,299,197	0.00													
02/07/03	946,481	2,310,497	3.92													
02/12/03	962,200	2,326,216	2.18													
02/20/03	984,662	2,348,678	1.95		110	190	2.9	1	1.6		4.70	7			0.14	3.18
02/28/03	1,007,365	2,371,381	1.97													
03/04/03	1,017,703	2,381,719	1.79													
03/11/03	1,035,026	2,399,042	1.72													
03/18/03	1,052,836	2,416,852	1.77													
03/27/03	1,075,172	2,439,188	1.72													
04/04/03	1,075,172	2,439,188	0.00													
04/10/03	1,091,686	2,455,702	1.91													
04/16/03	1,106,350	2,470,366	1.70													
04/24/03	1,127,879	2,491,895	1.87													
05/02/03	1,149,901	2,513,917	1.91													
05/08/03	1,158,417	2,522,433	0.99													
05/14/03	1,168,433	2,532,449	1.16		91	1300	1.9	1	0.7		3.40	7			0.15	3.34

TABLE 2
OPERATIONAL AND PERFORMANCE DATA FOR GROUNDWATER EXTRACTION AND TREATMENT SYSTEM

Redwood Oil Facility 114
1855 Guerneville Road
Santa Rosa, California
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TABLE 2
OPERATIONAL AND PERFORMANCE DATA FOR GROUNDWATER EXTRACTION AND TREATMENT SYSTEM
Redwood Oil Facility 114
1855 Guerneville Road
Santa Rosa, California
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TABLE 2
OPERATIONAL AND PERFORMANCE DATA FOR GROUNDWATER EXTRACTION AND TREATMENT SYSTEM
 Redwood Oil Facility 114
 1855 Guerneville Road
 Santa Rosa, California
 (Page 5 of 5)

Date	Effluent Totalizer (gal)	Total Flow (gal)	Average Flowrate (gpm)	Sample ID	TPHg (µg/L)	TPHd (µg/L)	B (µg/L)	T (µg/L)	E (µg/L)	X (µg/L)	MTBE (µg/L)	Other VOCs	TPHg Removed Per Period (lbs)	Cumulative (lbs)	MTBE Removed Per Period (lbs)	Cumulative (lbs)
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Notes:

W-INF	=	Influent water sample.
W-INT	=	Intermediate water sample.
W-EFF	=	Effluent water sample.
TPHg	=	Total petroleum hydrocarbons as gasoline analyzed using EPA Method 8260B.
TPHd	=	Total petroleum hydrocarbons as diesel analyzed using EPA Method 8260B.
BTEX	=	Benzene, toluene, ethylbenzene, and total xylenes analyzed using EPA Method 8260B.
MTBE	=	Methyl tertiary butyl ether analyzed using EPA Method 8260B.
Other VOCs	=	Other VOCs analyzed using EPA Method 8260B; see laboratory report for complete list of VOCs analyzed.
gal	=	Gallons.
gpm	=	Gallons per minute.
µg/L	=	Micrograms per liter.
lbs.	=	Pounds.
ND	=	Not detected at or above the stated laboratory detection limit.
<	=	Not detected at or above the stated laboratory detection limit.
—	=	Not sampled/Not analyzed.
a	=	TBA detected at 70 µg/L. Other VOCs were not detected at or above the laboratory detection limit. See analytical report for complete list of VOCs.
b	=	Analyzed using EPA Method 8020.
c	=	Analytical results not typical of past influent results or of monitoring data (ECM entry 08/17/04).
d	=	Effluent sample not required per Subregional Water Management System.

Data collected prior to September, 2004 compiled from the ECM Group *Systems Operations Report* dated July 9, 2004.